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The American telephone journal

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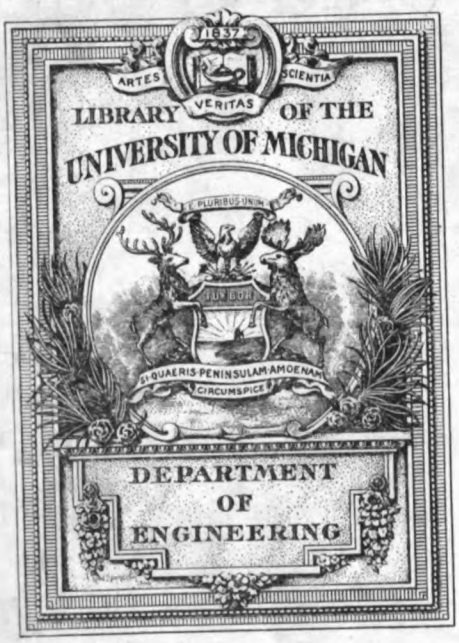

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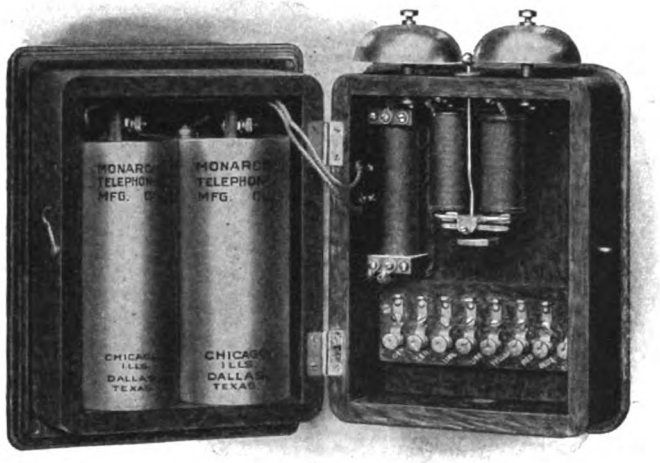

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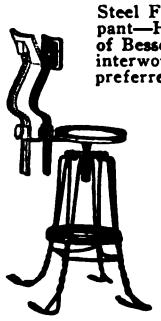

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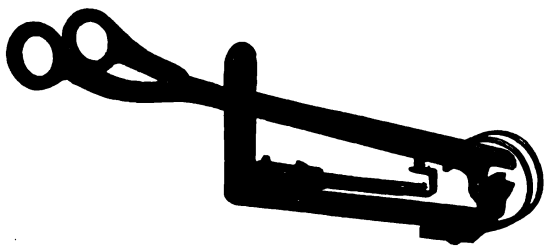

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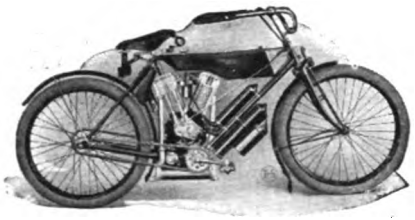

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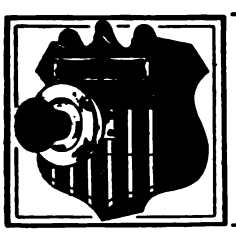

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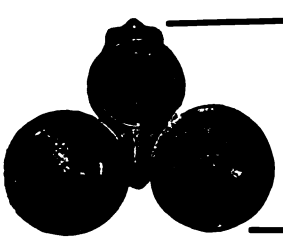

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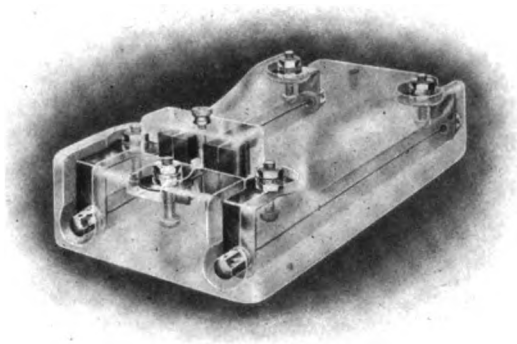

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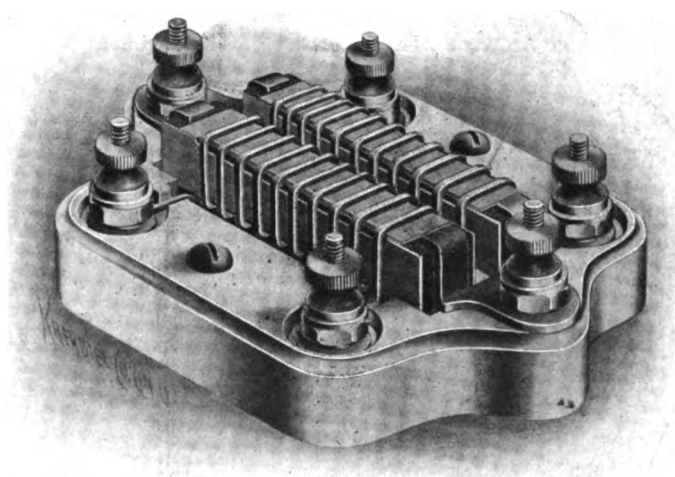

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Write for our guarantee proposition and special prices on rural line phones.

THE SUMTER TELEPHONE MFG. CO.

SUMTER, S. C.

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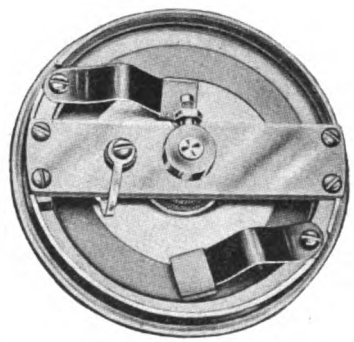

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

VOL. XVIII. NEW YORK, SATURDAY, JULY 4, 1908. No. 1.

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Maintenance by Motor

Few cities now are outside the classification of rural telephone line centers, and there is hardly a crossroads postmaster who is not interested in such subjects as weak batteries and tree grounds. Building of country lines is frequently undertaken with enthusiasm by farmers, but keeping them in good condition has been found to involve a steadiness of oversight, varied by promptness of action in emergencies, which are not in harmony with the principal occupation and habits of living of the owners. So in nearly every rural section where the locally owned telephone system is well developed, the natural progress along the line of least resistance has led to the training of some person who is known as the "telephone man," and he keeps a great many miles of line working. Where the lines center in a fairly large exchange, there may be two or three men, any one of whom is available at short notice to go out and clear trouble on a farmers' line.

Whatever the means adopted, and whatever the ownership of the system, the people who pay the maintenance bills always have the same protest, namely, that it costs a great deal of money for repairs, while the actual amount of work done on the lines and instruments seems to be very small. Getting down to details, and tracing out the purposes for which the money was spent in any given period, one finds that most of it has gone for items of carfare, team hire. meals and troublemen's time traveling. The reduction of the sum of these items is an ever present problem. If the lines are properly built, and sufficiently remunerative rates are charged, the results obtained by the management in this question of maintenance costs are the chief factors in the success or failure of the system of rural lines under its control.

Using the trains to reach cases of rural line trouble involves waiting, that for the troubleman seems almost always to be a period of idleness, although his time might well be spent putting in order little things which he considers capable of developing into actual troubles at a future date. Perhaps waiting for trains day after day often makes rural troublemen lazy, as we have heard some men confess that it does, and this is worth considering. Of course, for moderate distances, or to places with which the train service is absent or hopelessly inadequate, one drives, or, in some parts of the country, rides in the saddle. This, too, is a slow proposition. The horse must be cared for, allowed to eat leisurely, and even when in motion he travels slowly, according to our present day standards set by railway trains, fast boats, an occasional airship, and the ever present automobile.

The automobile itself offers, in some districts, an opportunity to reduce the maintenance costs—provided always that there is a considerable amount of this work to be done, and that the roads, the type of machine, and the skill of its driver are such that the new cost of the machine repairs does not pile up to an uncomfortable figure. With a properly designed automobile

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body, four or five linemen can start out with complete equipment for putting up a few new cross-arms and coils of wire, and be at work 20 miles distant before the sun is high.

For absolute economy, however, there are many telephone men who, after from one to three years of experience, are coming to speak in the most favorable terms of the motorcycle. With a machine well designed, well built and carefully driven, if the roads are in moderately good condition, a man can cover many miles of line in a week. The very low cost for man and machinery of traveling over a district in this manner, reckoned on either a mileage or hourly basis, seems to be a matter of record in exchanges where the experiment has been tried. Such questions as ability to travel by the shortest possible route are largely settled by local conditions. But it would seem that, on the average, the motorcycle enjoys advantages over the combination of train and team required for so many places. It is always superior in speed to the horse, and to come briefly to what is perhaps its chief point of superiority over both horse and railway, it is ready to make a trip at an instant's notice, and may be driven steadily at either a high or moderate speed or stopped suddenly at the rider's option.

All these things mean that a man can get over a great deal more rural territory by the motorcycle, and probably pay more careful attention to laying out his route strictly for the purpose of covering the maximum amount of work, than is possible with any other method of transportation. We know of one district formerly covered with difficulty by three men using trains and teams, which is now kept in excellent condition by one good man mounted on a motorcycle. Figures like this speak very clearly, suggesting interesting possibilities of study for almost any section.

Public Profit in Competition

Telephone competition—does it pay the subscribers? That is the big question with the public. Bell people say that it represents a loss to the public. Many Independents confess that their opinion that it is a good thing is based on general grounds.

Now comes the Ohio Independent Telephone Association with a proposition to show on a state-wide basis just about how much the public has gained or lost by this competition, in dollars. Figures printed on another page, abstracted from the *Bulletin* of the association, show that competition in Columbus has saved money to the Independent subscribers.

From the figures presented it appears that the subscribers to the Independent service have saved to themselves, on the assumption that the Independent service has been of equal value with the Bell service, and that these subscribers would have paid Bell rates in the absence of opportunity to secure the Independent telephones at the lower rates, an average of more than $100,000 a year for these six years. This does not give any credit to the Independent company for being a factor in the reduction of the Bell rates of one-fourth for business and one-third for residence service, nor for being a factor in giving Bell subscribers more and better service for their money.

The tabulation was simple. The average number of each class of users of Citizens' telephones was taken for each year and multiplied by the difference between the Citizens' rate and the corresponding Bell rate. The average number of telephones for the year was reached by adding the numbers in service at the first of each month through the year and dividing the total by 12. Where there is a considerable variation in the classes of Bell rates it may be a little more difficult to arrive at a fair average, but the purposes of the statement will probably not be affected by understating rather than overstating this average.

Another feature of the statement is found in the calculation of the amounts paid for Independent telephones duplicating Bell telephones. This may be somewhat difficult to estimate accurately because of lack of knowledge of duplications in extension instruments. In the Columbus case it is said that the amount calculated, $60,000 a year, is overstated rather than understated. This amount for Columbus is less than the present savings to Independent subscribers by the difference between Independent rates and Bell rates. This shows that the community as a whole is under no tax by reason of the so-called "duplication of telephones" and, as a whole, is getting all the value of such duplication without cost.

It is our opinion that many Independent companies have too long allowed the protests against the alleged wastes of duplication to pass with a mere challenge, when it would have been more appropriate to go to work vigorously to find out for themselves, not only whether there be waste or gain, but the measure of it. Reliable figures from many places which would, on analysis, lead to the same conclusions as those from Columbus, would leave the public no room for doubt. It is probable that results as valuable and interesting as those obtained at Columbus could be obtained in a very great number of cities where Independent companies are well established. A movement for the preparation, and exchange, by publication and otherwise, of such figures for many companies would have most commendable features.

Telephony Before the Electrical Engineers.

Two papers represent the contribution to the discussion of the art of speech transmission at this year's convention of the American Institute of Electrical Engineers. While one deals with the subject of wireless telephony, which is not yet as familiar as it should be, either to the public or to telephone men, its technical information cannot fail to be of the utmost interest to our readers. Its practical bearing will perhaps be more evident when the range of transmission has been some what increased, and methods of relaying between wireless terminal apparatus and metallic lines have advanced to the stage of commercial practicability.

The question of automatic exchange costs has long been a topic of primary interest, and the subject of much discussion in the telephone field. The Institute paper dealing with this will undoubtedly be carefully read. Perhaps not the least important result of its presentation will be a pointing of the way to new methods of studying manual exchange operating costs, and the bringing about of a firmer realization of the value and necessity of making such studies.

During the past two years or so there has been a large increase in the number of representative telephone men who have availed themselves of the advantages of membership in the Institute, and the results of their closer association with engineers in other branches of electrical industry cannot fail to be gratifying. Similarities of conditions and successful methods, and the relations of practical problems, are becoming more clearly understood, to say nothing of the development of a broader view, which is most appreciated by the individuals from a personal standpoint.

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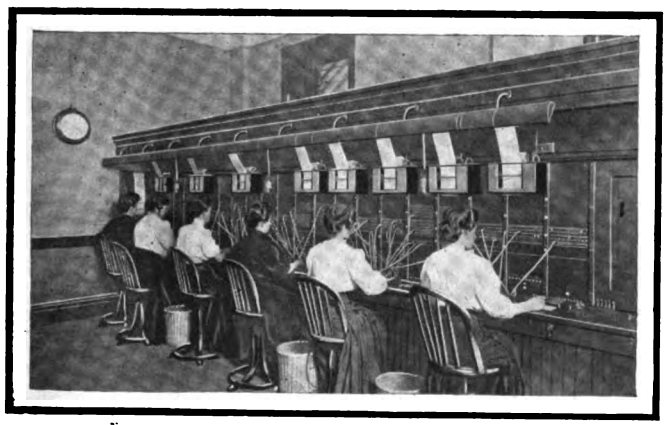
Telephony in the Hotel Astor, New York

By S. R. Edwards.

The New York Electrical Society, through the courtesy of Mr. Frederick A. Muschenheim, held the last meeting of the season at the Hotel Astor. Mr. Muschenheim delivered a very interesting talk on the uses which are made of electricity in the modern hotels. In the Hotel Astor motors are used for more different purposes and in greater numbers than any similar building in the world. Mr. Muschenheim told how electricity was used in the steam-generating plant for the driving of pumps, in the water supply plant, in the refrigerating plant, the heating and ventilating plant, the kitchen and various shops connected with the hotel. Electricity is also used for the fire-alarm system, the watchman's service system, the mail delivery, clock system and in many other devices for insuring the safety and comfort of the guests.

At the conclusion of the lecture, the members of the society were conducted to the telephone exchange on the second floor. All the apparatus connected with the telephone system is installed in one large room making it very convenient for operation purposes. In this room, in addition to the switchboard, the chief operator's desk and the wire chief's desk, are the storage batteries and power equipment, the main frame, relay rack, condenser and repeating coil rack, together with the power board and fuse panel.

The switchboard is a six position, common battery, bridging multiple type board of three sections. The first two positions are used for handling incoming trunk calls and are equipped with 15 pairs of steel cords. The other four positions are used for outgoing and interior calls and are equipped with 15 pairs of steel cords and two pairs of copper conductor cords for long distance calls. Each position on the switchboard is equipped with a telautograph machine which is plainly shown in the accompanying photograph. On account of the telautograph there are but two operators' positions to a section instead of three as is usually the case in this type of board. At the present time the board, which has an ultimate capacity of 1200 lines, is equipped with 60 trunk lines and 700 subscribers' lines, of which 550 are connected to the guests' rooms, and the remaining lines are used for communication between the various departments



The Six-Position Multiple Switchboard in Hotel Astor, New York.

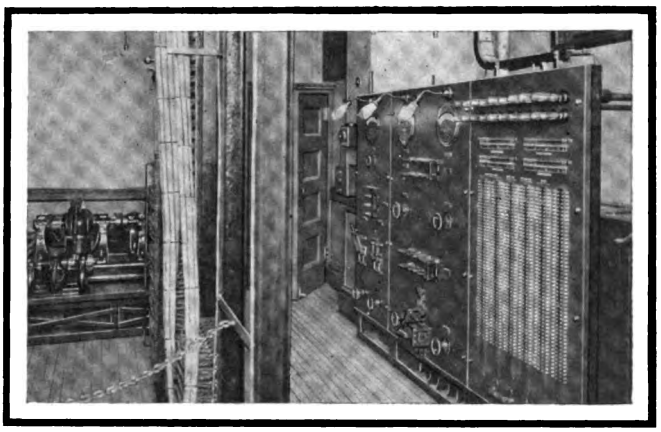
of the hotel. The room numbers appear on the switchboard in their regular positions and this greatly facilitates the service given the guests.

The end position of the board is not equipped for service, but contains keys for the supply of ringing current from the central office to each operator's position in case the local service should be interrupted. There are also five cords in this position which are used for connecting lines in trouble with the wire chief's desk and also for testing purposes.

When a call comes in on one of the trunk lines, the lamp under the trunk jack is illuminated and what is known as a "visual busy signal" is displayed on each position, thus indicating to the different operators that a certain trunk line is in use.

The lighting of the face of the switchboard is satisfactorily taken care of by placing 4-cp lamps spaced about 2 ft. apart and placed in a reflector trough which is hung out about 2 ft. near the top of the switchboard.

The chief operator's desk is of a standard type, having lines



A Corner in the Hotel Astor Telephone Exchange, Showing Part of Power Equipment, Power and Fuse Panels and Section of Relay Rack in the Foreground.

to each operator's position. The wire chief's desk, as shown in the photograph, is of a type in common use in small exchanges.

The main frame consists of central supporting uprights for cross bars. It is 9 ft. high, 2½ ft. deep and 4½ ft. wide. The wires from the central office terminate on the vertical side of this frame and are cross-connected to the horizontal side. From the terminals on the horizontal side, cables are run to the multiple jacks, to the answering jacks and to the signaling circuit, which includes a 50-ohm cut-off relay and a line lamp without the usual line relay. The line relay is omitted because the distance from the subscribers' stations to the exchange is so short that it was not considered necessary. The intermediate frame was omitted as the requirements did not make it necessary to change the operators' loads or vary the line assignments.

A departure is made from the usual practice in regard to the supervisory lamp as the circuit is opened by the supervisory relay instead of being placed in shunt. The relay rack, which contains the cut-off and other relays, is made of small I-beams and is 9 ft. high by 8½ ft. wide and 7 in. deep. The condenser and repeating coil rack is made of angle iron 2 in. x 2 in. x ¼ in. and is 9 ft. high, 4 ft. wide and 10 in. deep. The bars for supporting the coils and condensers are placed 4½ in. apart.

The ringing power equipment consists of two dynamotors with a voltage of 240 on the primary and 75 volts on the secondary, a speed of 950 r.p.m. and a current of 1 amp on the secondary. These dynamotors are used alternately every 24 hours.

The charging equipment consists of one 3-hp, 240-volt, 1750 r.p.m. motor direct connected to a 30-volt, 50-amp, 1750-r.p.m. generator, and one 3½-hp, 240-volt, 1950-r.p.m. motor direct connected to a 3-hp, 25-volt, 85-amp, 1950-r.p.m. generator. The storage battery consists of 11 cells of Type F, nine plate, made by the Electric Storage Battery Company. The power board is made up of two slate panels. Upon the first panel is a Weston voltmeter, together with a switch for throwing it across each cell of the storage battery or across the entire battery. The voltage of the battery charging generators can also be obtained on this voltmeter. Switches and rheostats for ringing machines are also placed on this panel. At the top of the second panel of

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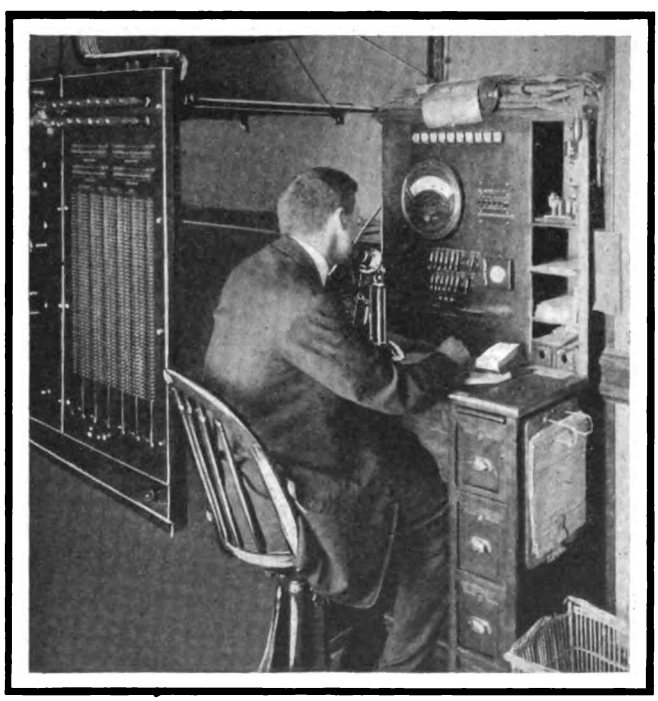
the board are two ammeters, one of which indicates the rate of discharge and the other the rate of charging of the storage battery. The switches for cutting the charging generator sets in or out are also located on this board, as is an overload and underload circuit-breaker, which is placed in the charging circuit of the battery.

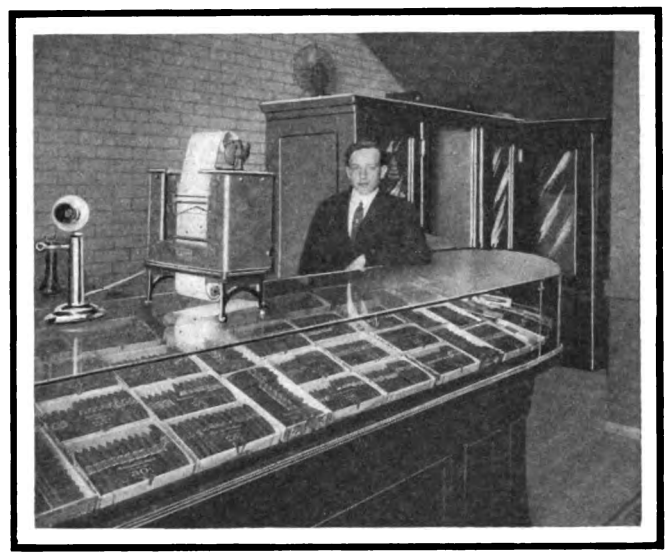
The fuse panel, which is placed at the end of the two power panels, carries fuses for the cord circuits, line lamp leads, trunk circuits and other miscellaneous fuses used in connection with the exchange. Upon the top of this panel are mounted resistance lamps which are placed in the generator ringing circuit to equalize the ringing load distribution on the various switchboard positions. Immediately below the lamps are the fuses which protect the emergency ringing circuit from the central office. All the fuses on this panel are placed in shunt with drops which are mounted on the relay rack. When a fuse is blown, a battery current is shunted through the drop, the shutter of the drop is operated and an alarm bell is sounded. The face plate on each drop carries two figures indicating the number of the strip and the position of the fuse, so that by referring to the drop which has been operated, the blown fuse can be very readily located.

As previously mentioned, each position on the board is equipped with a telautograph transmitter, which is mounted on the keyboard, and with a pilot receiver which reproduces all the writing done on that particular position.

By means of keys, messages may be transmitted by the operator over the telautograph to the various departments interested in the service which is called for by guests. For instance, if a guest calls for stationery, ice water or daily papers, the order is written by the telephone operator in her telautograph transmitter and simultaneously recorded at the service boys' station on that particular guest's floor, and the message is also recorded on the telautograph in the main service room on the ground floor. A service boy fills the order, goes back to the station and writes on the telautograph transmitter that he has filled the order. This O. K. is recorded on the telautograph in the service room on the ground floor and also on the telautograph on the switchboard. There are, therefore, three records of the order, one held by the telephone operator, one by the captain of the hall boys and one by the hall boy who fills the order. If a guest should desire his breakfast served in his room, the order which he gives the telephone operator would be recorded by telautograph in the kitchen, as well as at the service station on that particular floor. If a person calls up one of the guests at the hotel by telephone, the telephone operator writes the name of the guest on the telautograph and this is duplicated at the "information clerk's" desk. The clerk obtains the room number or any instructions the guest may have left from an index book and writes the answer back to the telephone operator. In case a guest should not be in his room, the telephone operator would send a telautograph message to the office to page the guest through the house, and this message would be torn off the telautograph and delivered to the page. If a guest is not found, a message would be left in his mail box to inform him on his return. A perfect record of the transaction from the start to the finish is thus obtained, and in case of error, the blame can be instantly placed. The guests can always be satisfied that the management of the hotel have done their duty, as the telautograph record is always available and shows what effort was made to locate the guest when the call came in and also what disposition was made of it.



The Wire Chief's Desk and Part of the Power Panels.



The Grill Room Telephone Pay Stations, Showing Telautograph, by Means of Which the Clerk is Advised of the Amount Due for a Call.

The information clerk is also provided with a telephone so that if he does not understand the message given him by the telautograph he can get into communication with the operator. For this purpose a special circuit is arranged. A box containing seven keys is placed under the clerk's desk. One key operated by a cam lever throws the clerk's telephone from the regular line onto the special circuit. The remaining six keys are lettered to correspond with the operators' positions and by depressing a certain key the operator desired can be signaled. For instance, should the clerk desire to talk to "B" operator, he would throw the cam and then depress button "B." A green lamp beside the pilot lamp on the "B" operator's position would be illuminated, thus informing the operator that the information clerk wished to talk to her. She would then press a button in the order wire strip of keys, cutting her telephone into the circuit and extinguishing the lamp.

In the basement of the hotel, convenient to the grill room, are located five telephone pay station booths. The lines from these booths are connected direct to the telephone exchange on the second floor. When a person makes a long distance call, connection is made through the switchboard and the operator writes the amount of the charge on the telautograph, sending it to the clerk at the cigar stand, which is located by the booths. When the party comes out of the booth, the clerk tells him exactly the amount which is due for his telephone call. There are also seven pay stations on the main floor, which are handled through a small two-position board designed specially for the purpose. This board is operated independently from the main switchboard, 10 trunks being connected direct to the central office, although there are four tie or connecting trunk lines to the main switchboard.

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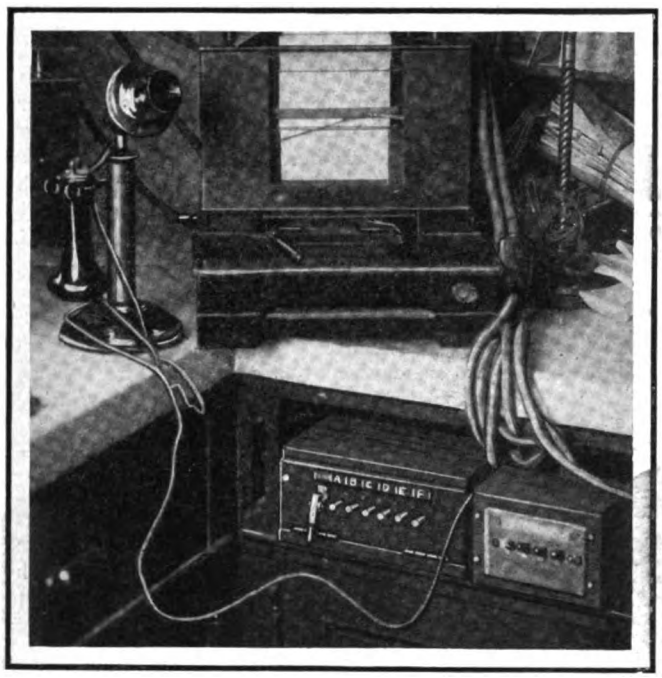
In the basement, in the engineer's office, is located a 90-line mahogany switchboard. It has three trunk lines to the central office and five tie trunks to the main switchboard. It has 45 extensions connected to it and handles calls from various service departments, thus relieving the main switchboard of a large number of calls. All the elevator cars in the hotel are equipped with telephones connecting with this switchboard. These tele-



Information Clerk's Desk in the Front Office, Showing Desk Telephone and Switch for Connecting Telephone to the Different Operators' Positions. A Part of the Telautograph and Controlling Switch is Also Shown.

phones are used for giving orders to, or communicating with, different departments while a person is going from floor to floor.

There is also a small switchboard known as the monitor's switchboard which is located convenient to a stenographer in an ante-room of the business offices of the hotel. The purpose of this switchboard is to provide means for answering calls to any of the persons in the business offices whether they are in the office or not. When a call comes in, a lamp on the monitor's board indicating the line called, is illuminated and remains so until the call has been answered. In case the lamp is not extinguished within a reasonable time, the stenographer in the ante-room cuts in her telephone by means of a key and takes the call. In case the person called happens to be in one of the other offices, the calling party is requested to hold the line. The stenographer then switches her telephone upon the other line, gets in communication with the party called and delivers the message, taking whatever answer is given and delivering it to the party calling.

In order to obtain an idea of the use of the telephone by the hotel guests, records were kept through the busy months and it was found that there was an average of 3000 outgoing suburban and long distance calls made and 2500 incoming received during one month. The longest outgoing calls were made to Chicago and Cincinnati. The hotel contract with the New York Telephone Company calls for 300,000 outgoing messages per year. The total daily traffic is over 4000 calls, and perhaps 30 per cent of this traffic is carried between the two afternoon hours of from 4 to 6 o'clock. About 200 messages for guests are also recorded daily by the operators. Four operators are usually kept at the board, although during the busy hours in the morning, from 8 to 12 o'clock, and from 5 to 8 o'clock in the afternoon, five operators are used. During the night, from 12 o'clock until 8 o'clock in the morning, but one operator is employed. The operators average eight hours work a day, but are not on duty over six hours at a time.

As is shown by the foregoing, the telephone now plays an important part in the modern hotels, although its usefulness and convenience have been but recently appreciated and recognized by hotel managements. Up to five years ago none of the large transient hotels had telephones in every room, but now it is the exception for a hotel not to have this service, while the ingenious methods worked out and applied by Mr. Muschenheim would appear to be of almost universal application in hotel service.

Purification of Telephone Transmitters

Some recent data on a medical point of controversy is given in the following cable dispatch from London, of June 27: "According to a report by a medical officer from Westminster to this week's *Lancet*, a startling result has been attained from a test to discover whether tuberculosis germs exist in telephone mouthpieces. One of the post office public telephones on the central exchange was wiped around with a swab to remove any existing germs in the mouthpiece, and the contents of the swab used to inoculate two guinea pigs. One guinea pig was killed 23 days after inoculation, and a post-mortem examination showed pronounced signs of tuberculosis. The second guinea pig was killed 27 days after inoculation and showed similar signs of infection, thus proving that the deadly germs of tuberculosis can be transmitted by the public telephones as at present in general use.

"It is added that this proves conclusively that all telephones, whether in public or private use, need to be periodically disinfected, as is the case on the London Stock Exchange, where the 50 telephones are sprayed daily with a disinfectant under an agreement with the General Post Office."

The Monitor's Switchboard Used in the Business Offices to Insure All Calls Being Answered.

Wireless Telephone Used on Lake Steamer

It is reported that a wireless telephone is in successful operation on the new D. & C. steamer *City of Cleveland*, which plys between Detroit, Mich., and Cleveland, Ohio. The apparatus used is made by the Clark Wireless Telegraph-Telephone Company, of Detroit. It is stated that communication has been had with the boat at a distance of 20 to 25 miles.

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Railway Telephony*

By W. E. Harkness.

I find in looking over the *Official Railway Guide* that out of some 1100 railroads operating 257,000 miles of track, 213 roads, or 19 per cent, are operating their lines by telephone and have no telegraph connections whatever. The total mileage of these roads is 17,358, or 6¾ per cent of the total railroad mileage.

BLOCK SIGNAL TELEPHONES.

A further use of the telephone in connection with the movement of trains is in connection with the operation of block signals. The usual method of communication between block signal towers is by means of telegraph or bell signals. Some roads are using the telephone for this purpose, and have found it superior to either the telegraph or bell signals, as it enables more detailed information to be passed between the adjacent towers and movements of trains effected which was not possible under the old system. In this way the handling of the traffic is facilitated and the operating expense caused by delayed trains reduced.

Of the various railroads approximately 100 are using block signals, and of these 77 are using the telegraph, 16 the telephone and 10 bell signals. About 8 per cent of the trackage operated is handled by telephone, 2 per cent by bell signals and the remaining 90 per cent by telegraph. The largest user of the telephone for this purpose is the Atchison, Topeka & Santa Fe, which operates its 1800 miles of track by telephone exclusively. The Burlington is operating some 1100 miles, and the Illinois Central about 800 miles of track in the same way.

SIDING TELEPHONES.

On many of the Western roads there are sidings located at some distance from the regular stations and in some cases between stations, where trains must await the passing of other trains. Telephones are located at these sidings in booths or boxes on the poles, and the train crews report their arrival and the passing of other trains, to the nearest station and receive instructions governing their movements. This arrangement does away with the opening of many telegraph offices which would otherwise be necessary. Some railroads equip their trains with portable telephone sets which may be used for this purpose or in cases of accident. In this case connection is established with one of the telephone or composited telegraph lines and the nearest station called.

TELEPHONES FOR CALLING TRAIN CREWS.

At large terminals or division headquarters where freight trains are made up, it is necessary to notify the train crews when to report for duty. The usual method of doing this is to send a boy to the residence of each member of the train crew as soon as the leaving time of the train is determined so as to have them ready to take out the train. The delays to trains occasioned by failure to get this information to the crews promptly occasion a large loss to the railroads, as it frequently happens that some of the members of the crew are found to be sick or cannot be located, and other men must be sent for. To overcome this difficulty some of the roads are installing telephones in the residences of their crews, and are calling them by telephone instead of by messenger; in this way getting prompt replies as to whether they can report, and if not another man can be quickly called to take the place of the first and thus get the train out on time. A further saving in the labor expense is thus made, as these crews are usually paid by the hour when delays occur.

At Altoona, Pa., one of the largest division points of the Pennsylvania Railroad, 525 telephones have been installed by the railroad company in the residences of their employees for this purpose. These sets are connected four on a line, and are handled by one operator at the private branch exchange where the lines terminate. This installation does the work of 15 call boys and has been found more satisfactory in every way, including greater economy.

TELEPHONE SERVICE FOR ROUNDHOUSES.

In making up trains it is necessary to provide for notice being given to the motive power department to prepare the necessary locomotives, and when the trains are made up to send them from the roundhouse to the freight yard or passenger station. This in many cases is being done by telephone in place of by telegraph.

WRECKING TRAIN SERVICE.

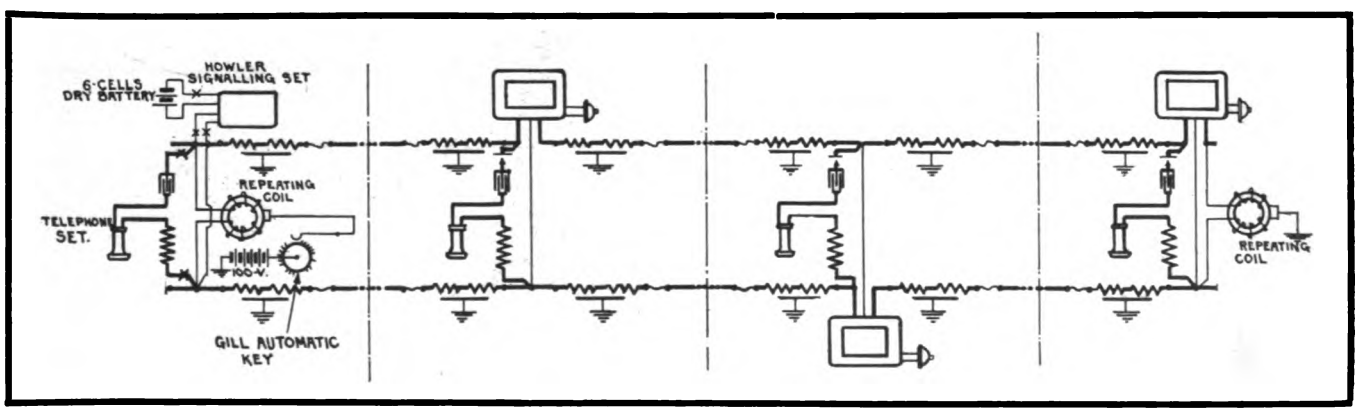
In case of a wreck occurring on a railroad, it is necessary to send out the wrecking train at the earliest possible moment, and to do this the special crew for this train must be assembled quickly. Some roads have constructed special lines to the residences of these crews for this purpose exclusively, and in this way are able to assemble a crew and start a train very quickly.

Portable telephone sets are furnished the wrecking trains so that connection may be established with telephone circuits along the line, or, if these are not available, with composited telegraph lines, and in this way keep the officials informed as to conditions and receive instructions.

TELEPHONE SERVICE IN FREIGHT YARDS.

In large freight yards, clerks are employed to report the names and numbers of all cars entering or leaving the yards, and a record of the movement of every car is made in the car accountant's office.

These yard reports are usually sent to the car accountant in writing, which of course requires labor and time, and delays the entries on the records. In some yards these reports are made by telephone, the yard clerk reading from his memoran-



Circuit of the Type Used by the New York Central Railroad for Telephone Train Dispatching.

*Concluded from issue of June 27, 1908.

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dum record to the clerk in the car accountant's office, thus permitting records to be made promptly.

Where perishable freight is being handled a delay due to cars being held in the yards by mistake, or for repairs, often causes a considerable loss to the railroad. The use of the telephone by the yard clerk or the train master often enables these cars to be moved or repaired promptly, thus preventing the loss and rendering better service to the shipper.

COMPOSITE SERVICE.

One of the objections raised by the railroads, where an attempt is made to introduce the telephone on their lines, is the expense of the necessary wire plant to meet their requirements. To meet this objection special telephone sets have been designed which may be connected to existing telegraph circuits without interfering with the operation of the telegraph, and without the latter interfering to any great extent with the telephone service.

In this way a fair grade of telephone service can be rendered at a small expense for equipment and experience has shown that this leads to a demand for better service and equipment.

The telephone sets and other apparatus used for this railway composite service differ from that used in either magneto or central battery exchange service. The signaling is done by means of an alternating current of high frequency, generated by a vibrator and induction coil in the set. This induction coil is also used for transmission purposes. The signal-receiving device, or howler, as it is called, consists of special high resistance telephone receiver, equipped with a resounding horn, to amplify the sound caused by the vibration of the diaphragm responding to the high frequency signalling current coming over the line from the calling station.

The intermediate telegraph stations on composited lines are equipped with a special 1-m.f. condenser and a 1000-ohm non-inductive resistance, the condenser being bridged around the relay and key so that telephonic transmission will not be interrupted when the telegraph key is operated. It also offers a path of low impedance for the high frequency signaling current, and prevents the operation of the telegraph relay being affected by this current. The non-inductive resistance is bridged across the terminals of the telegraph relay to prevent the discharge of the condenser or the high frequency signaling current affecting the operation of the telegraph relay. An impedance coil and condenser are necessary at the terminal telephone stations to reduce the interference from the telegraph impulses.

The telephone service rendered by these sets, while not equal to that obtained on a straight telephone line, is in many cases good enough for the service required and, as stated before, has created a demand for better service, and has led to the construction of metallic telephone circuits.

There are now several thousand of these sets in use throughout the country, principally in the middle and extreme West, where stations are far apart and the cost of constructing telephone lines correspondingly high.

The length of line over which satisfactory service can be rendered by these sets varies with the kind, size and age of the line wire and the number of intermediate telegraph stations on the circuit. In general 100 miles of No. 8 iron and 200 miles of No. 12 copper may be taken as the limit of this service.

LONG DISTANCE SERVICE.

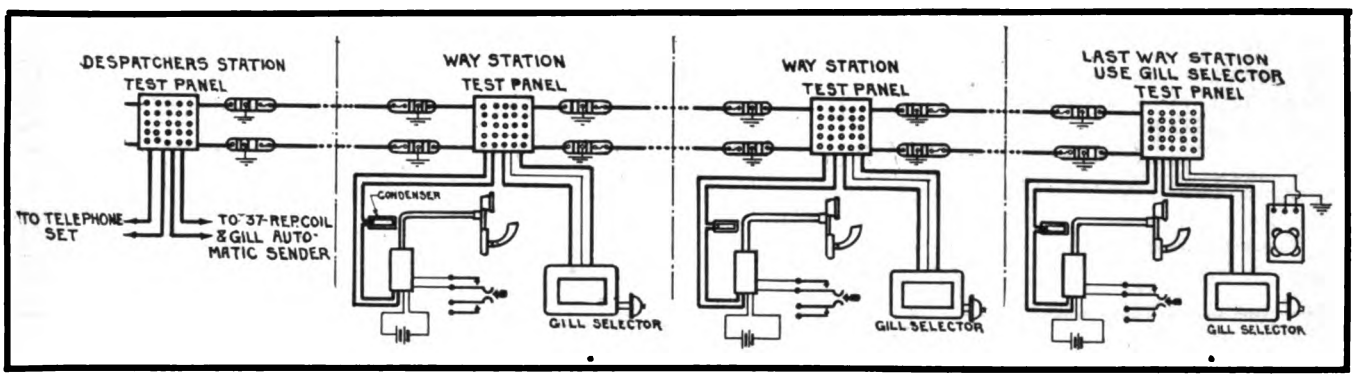
The use of the railway composite sets has shown the railroad officials the advantage of telephone service between distant points, such as division headquarters and general offices, and in many cases this system is used between such offices. Where distances or the condition of the lines were such as to prevent satisfactory service, regular copper metallic circuit telephone lines have been constructed. The distances covered in this manner vary from 100 to over 900 miles. For example: The New York Central and the Lake Shore Railways have a through metallic circuit line from New York to Chicago. This line is used in sections between main points, as, for instance, New York and Albany, Albany and Buffalo, Buffalo and Cleveland, etc., for service between division offices and is connected straight through when a New York-Chicago connection is desired.

The Illinois Central has a similar line from Chicago to New Orleans, used in the same general way.

The Pennsylvania lines also have their own long distance telephone lines between important points.

As a temporary means of securing this long distance service many of the roads are compositing their copper duplex or quadruplex wires and in this way obtaining first class telephone service at a small expense. The Union Pacific has recently composited two duplex wires for this purpose between Omaha, Neb., and Cheyenne, Wyo., a distance of 500 miles, and is obtaining excellent service. In addition to using this telephone circuit for conversation between officials, messages are being sent over the circuit which were formerly sent by telegraph, operators being located at each end to send and receive messages by telephone. These messages are written out in the same way as telegrams, and are handled exactly the same way except as to the method of transmission.

The Canadian Pacific has composited a circuit from Montreal to Winnipeg, a distance of 1430 miles, with intermediate telephone stations at Fort William and North Bay. The Pennsylvania lines are also compositing their duplex and quadruplex circuits to obtain additional telephone facilities. The indications are that this particular branch of railway telephone service will show a marked development during the next few years, and will do much toward the further introduction of the telephone for railway purposes.



Outline Diagram of Dispatcher's Telephone Circuit Showing Method of Cutting Stations Into Line.

The New Telephone Exchange in Ashtabula, Ohio

The new building for the Ashtabula Telephone Company has been completed and the work of installing the new switchboard is now in progress. At the present time but 200 lines will be installed. The North automanual system is to be used, and this is the first plant of the kind to be installed. Its introduction will be followed with much interest by telephonists of all grades.

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A Study of Multi-Office Automatic Switchboard Telephone Systems*

By W. Lee Campbell.

This paper treats of three principal topics:

1. The enormous economic waste which the wire, cable and conduit equipment of a telephone system involves.

2. A recapitulation and discussion of reasons which make this waste necessary or expedient in manually operated systems.

3. How this waste can and should be greatly reduced in systems employing automatic switchboards.

In other words, as most automatic switchboard plants have been installed in conformity with practices which emanated

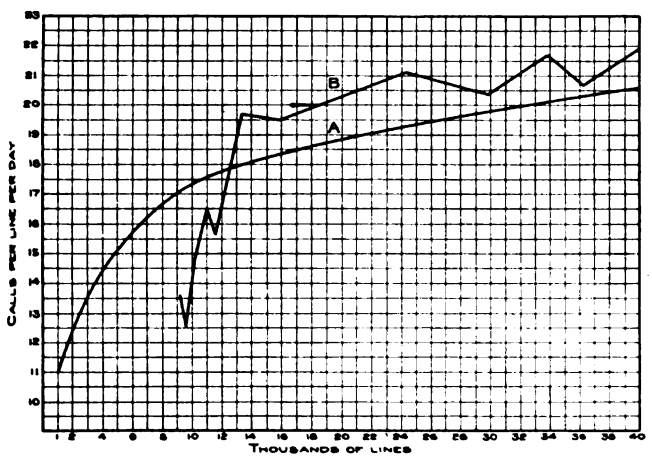

Fig. 1.—Curves Showing Arbitrary and Average Number of Lines in Service and Number of Calls per Line per Day on the Manual Switchboard.

from experience with manual switchboard systems, the writer will discuss some of the reasons for these practices and endeavor to show that they can profitably be ignored in plans for automatic systems. To accomplish this he has made a study of the principal factors in the first cost of plants of both types, together with certain factors in their operating expenses. Since many telephone engineers have possibly not had an opportunity to study these factors, and would be much interested in a comparison of them, the writer has so arranged his data that they will be of use, not only in the discussion of his theme, but also in a determination of the measure of success which automatic switchboards have attained in furnishing the speedier, more uniform and more economical service expected of them by the men who labored so hard and faithfully to develop them, and by the pioneers who had the courage to be their early purchasers and operators.

The first cost of a telephone plant using switchboards of either type may be divided into three principal items:

1. Cost of the apparatus (both central office and subscriber's station).

2. Cost of the central office buildings and furnishings.

3. Cost of the wire, cable and conduit plant.

In the third item of the first cost—the wire, cable and conduit plant—we find the largest factor of the three. The writer will not attempt, however, to give any average figures on the amount of this item. It is a variable quantity, depending in each system, not only upon the number of lines in the plant, but also upon the character of the soil, upon the average length of line as controlled by the density of population, by the form of the city, by the relative location of the business center or centers, and by obstructions, such as rivers, lakes, etc., and upon other similar conditions. Under almost any circumstances this part of the system will cost more than the two other parts combined; not infrequently it will represent two-thirds of the entire first cost of the system.

It will, therefore, probably tax the credulity of engineers, whose experience has been in connection with electric power and lighting, when the writer states that in the average telephone system containing one central office only, nine-tenths of the cable and wire plant is idle—not in use for transmitting conversations, even at the peak of the load; and, too, that on the average during 24 hours' service, 98 per cent of the wires are not in use. Yet such is the fact. Indeed, from observations made in a large number of automatic plants during the busiest hour, it was found that in offices of from 8000 to 10,000 lines, handling a comparatively heavy traffic, the maximum number of conversations taking place at one time was equal to slightly less than 4 per cent of the number of lines in service. As each conversation represents two lines, this would indicate a maximum of 8 per cent of the lines engaged for conversation, operating and signaling at the peak of the load.

Excepting party line service, which at best is but a partial remedy, there is only one method known to telephone engineers of to-day for materially reducing the great economic waste represented in the 90 per cent of the costly cable, wire and conduit

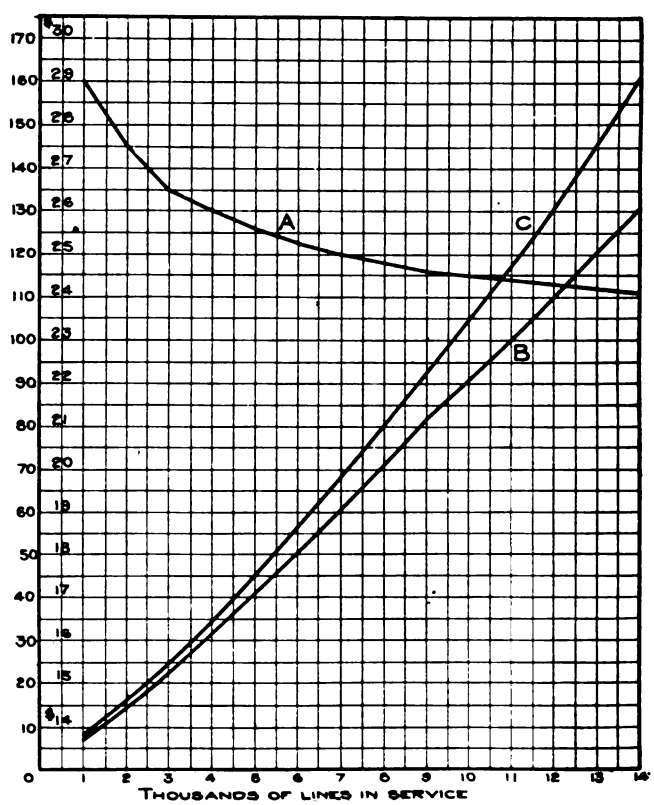

Fig. 2.—Curves Showing Size of Manual Exchanges and Costs per Line of All Except Long Distance Equipment.

equipment which is not in use even during the "rush hours." This method is to divide up each plant so that instead of one large central office it will employ a number of smaller offices. Just how much saving can be effected in this way, depends upon the local conditions in each city; but it will be readily understood that if small central offices or stations should be distributed over a city at the centers of well selected districts, the telephones in each district being connected only to the local station, the subscribers' lines would be decidedly shorter and

*A paper presented at the twenty-fifth annual convention of the American Institute of Electrical Engineers, Atlantic City, N. J., June 29, 1908.

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cheaper than when all run for many blocks to a large centrally located office. For interconnecting between the district stations, only trunk lines would be needed, and it is necessary to have only enough of these to handle the busy-hour traffic; that is, the trunk lines need to be but a small percentage of the number of wires which would be installed if each telephone should be directly connected to one large central office.

An arrangement resembling that just outlined is in use in large cities, where of necessity some division has been made in manual systems for the reason that it is physically impracticable to terminate all lines in one multiple switchboard; that is, within the reach of each operator. Many telephone engineers do not consider it good practice to connect over 10,000 lines to one manual board, and while several boards have been installed with an ultimate capacity of 18,000 lines, the parts are so small and comparatively delicate that it is probable that repairs and depreciation will be exceedingly large items.

The writer does not wish to convey the idea that in manual practice systems are not divided up to save wire and cable; for in a very large city covering a great area this must be done. For example, in Chicago there are 15 or 16 central offices averaging about 3000 lines each. But division of an office of less than 10,000 lines is generally regarded as undesirable and to be avoided wherever possible. It is, therefore, the general practice in smaller cities to carry all or the bulk of the business on one large board, smaller branch boards being installed under suffrance and only for urgent reasons. The writer hopes to demonstrate that while this antipathy toward dividing offices of 10,000 lines or less is reasonable in manual practice, it is not reasonable in automatic practice.

Taking up the study of the factors that govern the first cost of a common-battery system of either type, and considering them in the order in which they have been named, we find first, that the cost of the ordinary direct-line, flat-rate telephone at the subscriber's station is about the same ($7.25 each) in all sizes and conditions of modern common battery manual plants,

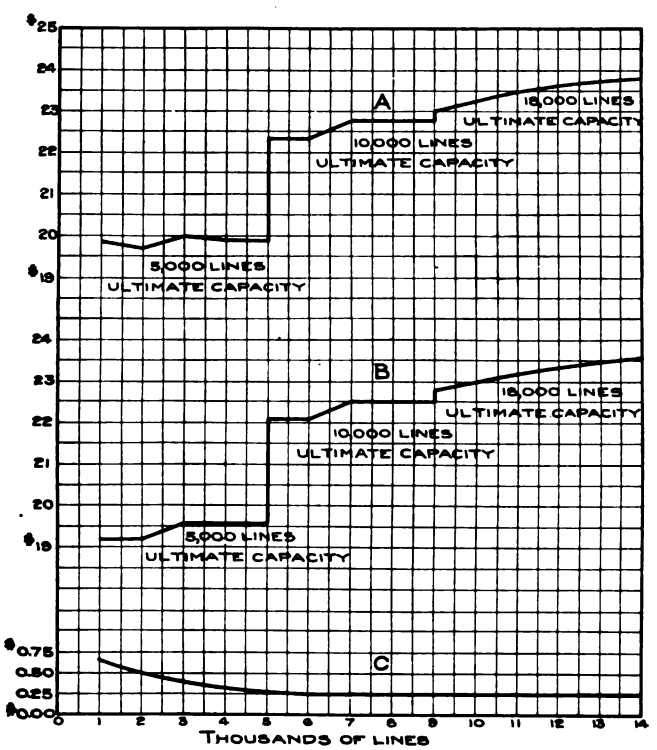

Fig. 3.—Curves Showing Cost of the Automatic Central Office Equipment.

and $12.50 each in automatic plants. The cost of a private branch switchboard at a subscriber's premises is not materially affected by the size, location or type of the central office to which it is connected. This, therefore, will not be considered.

The cost of the central office equipment when all installed in one office depends upon the number of lines entering the office, and the number of connections demanded during the busy-hour of each day. No storage feature is possible in a telephone plant. The switchboard must be designed to take care of the peak of the load, no matter how exaggerated that peak may be.

For the purpose of this paper, the writer has drawn, as shown in Fig. 1, an abitrary curve, *A*, from which will be taken all figures used on the number of calls made per line per day in plants of different sizes. While this curve is not an unreasonable one, for flat-rate lines, it does not purport to be an exact average. Curve *B* in Fig. 1 shows the growth in the average

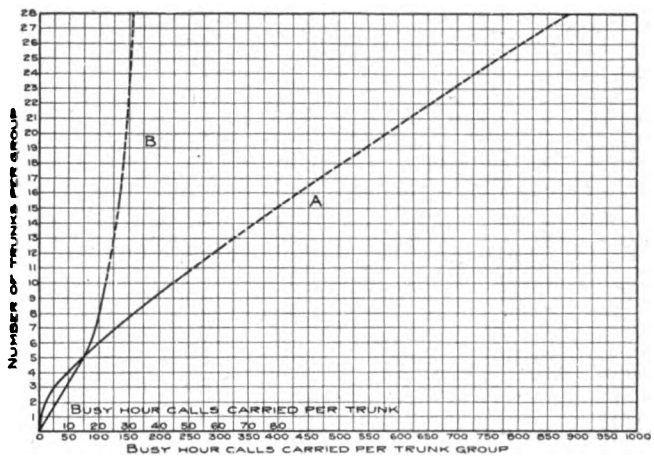

Fig. 4.—Curves Showing Relation Between Number of Busy Hour Calls and Trunks and Calls Carried per Trunk and Number of Trunks in a Group Automatic System.

number of lines in service and in the average number of calls per line per day in the "Chicago district" of the Chicago Telephone Company during the series of years, from 1893 to 1906. The writer supposes that the comparatively small traffic from 1893 to 1897 is largely due to the business depression then existing and to the fact that the telephone had not then been sufficiently advertised to make it such an important factor as it now is in our business and social intercourse.

It will also be taken for granted that the number of calls made during the busy-hour of each day is one-eighth of the total day's business. Experience shows that this is an average ratio. The average busy-hour's work of an operator in the small manual plants is about 225 flat-rate connections; in the large manual plants about 250 flat-rate connections when no calls are trunked to other offices. In explanation of this difference in connections handled it might be well to say that discipline is usually better in the larger offices, and consequently the operators do more work than in the smaller ones.

With the foregoing points determined, curves *A* and *B*, Fig. 2, have been constructed. Curve *A* gives the number of flat-rate lines per operator's position, and *B* the number of operators' positions for manual switchboards equipped for from 1000 to 14,000 lines, and for handling the number of calls per line per day indicated by curve *A*, Fig. 1. Curve *C* was then constructed, using the figures represented by curves *A* and *B* and the average prices at which a number of modern, well-constructed manual central office equipments using common battery multiple switchboards have been sold and installed.

Curve *A* in Fig. 3 gives the cost installed of automatic central office equipment for offices of from 1000 to 14,000 lines, designed to handle the number of calls per line per day as given by curve *A*, Fig. 1. The cost of central office equipment of either type includes cost of terminal racks, power plant, wire chief's, information clerk's and trouble clerk's desks; in short, all ap paratus except a long distance board and its accessories. In making up the figures on the cost of automatic equipment, the number of trunking switches necessary per hundred lines for handling the busy-hour traffic was taken from curve *A*, Fig. 4. This curve, which is the result of thousands of observations made in automatic offices, follows the empirical formula:

$$\text{Trunks} = T\,C + 2.8\sqrt[3]{T\,C},$$

in which *T* represents the length in hours of the average connection and *C* represents the number of busy-hour calls.

For the benefit of those not familiar with automatic switch-

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boards, the writer will state that each line terminates in what is generally called a line-switch. These line-switches are arranged and multipled together in groups of 100 each. Connections between these groups are made by means of trunking switches called first selectors, second selectors, third selectors, and connectors. In a system having an ultimate capacity of 1000 lines, first selectors and connectors are the only trunking switches

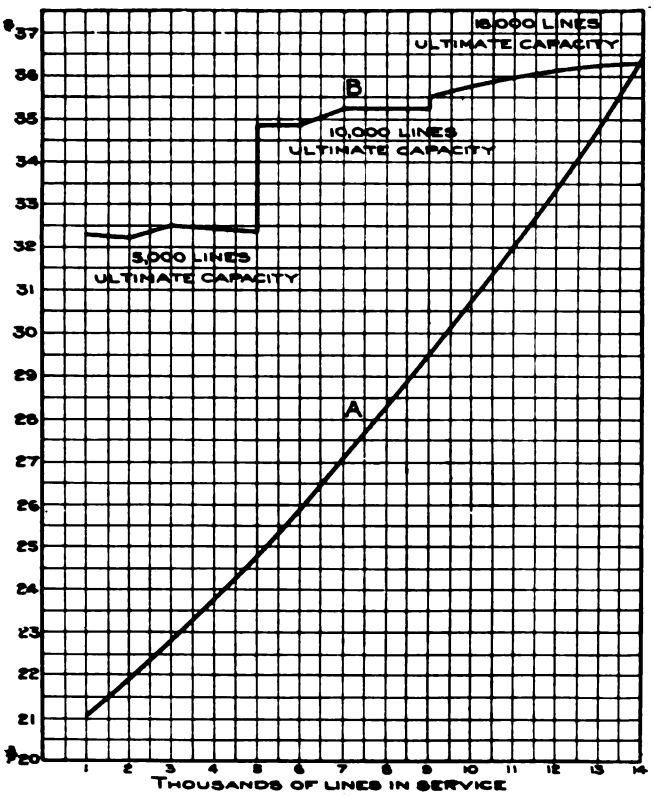

Fig. 5.—Costs of the Manual and Automatic Central Office Equipments.

used. When the ultimate capacity is increased to 10,000 lines, second selectors are required also, and when the ultimate capacity is increased to 100,000 lines, third selectors are added. In a 100,000-line system, then, there is one first selector, one second selector, one third selector and one connector for each trunk equipped.

A system with an ultimate capacity of 18,000 lines is made by installing a section of switchboard equipped for 8000 lines and arranged for an ultimate capacity of 10,000, and another section of switchboard equipped for the remaining 10,000 lines and using third selector switches as if installed for an ultimate capacity of 100,000 lines. Such a combination does not involve any complications and makes the cost less than if the entire equipment were arranged for an ultimate capacity of 100,000 lines.

The cost of banks of 10 selector switches of each type and 10 connector switches per 100 lines, was included in all figures to allow margin for the practice recently introduced into automatic plants of moving selector and connector switches about from comparatively idle to busier sections in order to handle the busy-hour traffic with the least possible number of trunking switches. This practice is similar to that common in manual plants of apportioning the work among the operators' positions by means of an intermediate distributing frame.

In comparing these two first-cost curves (*C* in Fig. 2 and *A* in Fig. 3) it will be seen that the cost per line of manual equipment increases rapidly with the size of the office. This increase is principally due to the greater and greater number of multiple jacks which must be placed within each operator's reach, whereas, since the automatic is a trunking system, the cost per line is affected only by the slow growth in the number of trunks necessary to handle the busy-hour calls, and, at intervals, an increase in the ultimate capacity of the switchboard. The price of this equipment, therefore, rises more gradually and in the larger offices falls below that of the manual type.

For comparison only, the writer showns in curves *A* and *B*, Fig. 5, the respective costs of manual and automatic central office equipment as given by curve *C*, Fig. 2 and *A*, Fig. 3, plus the cost of one telephone per line.

Taking up the second item of first cost for single office systems, the writer would direct attention to Fig. 6 in which curves *A* and *B* give the square feet of floor space required on the average for automatic and manual central office equipments, respectively. Curve *C* gives the cubic feet of space required for automatic equipment and curve *D* gives the cubic feet of space required for manual equipment. In this same figure curve *E* for automatic equipment and curve *F* for manual equipment give the first cost of the necessary space in fireproof buildings at an estimated rate of 19 cents per cubic foot for housing the automatic and manual equipments indicated. The cost of furnishings and land, and cost of space used for executive offices, storage, etc., are not included, nor is the cost of space usually allowed for a growth of at least 20 per cent to 25 per cent in switchboards included. The figures do, however, include the cost of space for operators' rest rooms, hospital, dining room, kitchen, etc.

It will be noted that the cost of building space for automatic equipment is considerably less than that for manual equipment, and that for offices of over 5000 lines the automatic occupies about half the space required for the manual. No effort has been made to secure comparative figures on the cost of furnishings, but they are unquestionably more expensive in manual offices, since here recreation and rest rooms, restaurant, kitchen, etc., are commonly furnished and equipped for the use of the operators. In automatic offices the number of employees is comparatively small and the men are in the majority, conse-

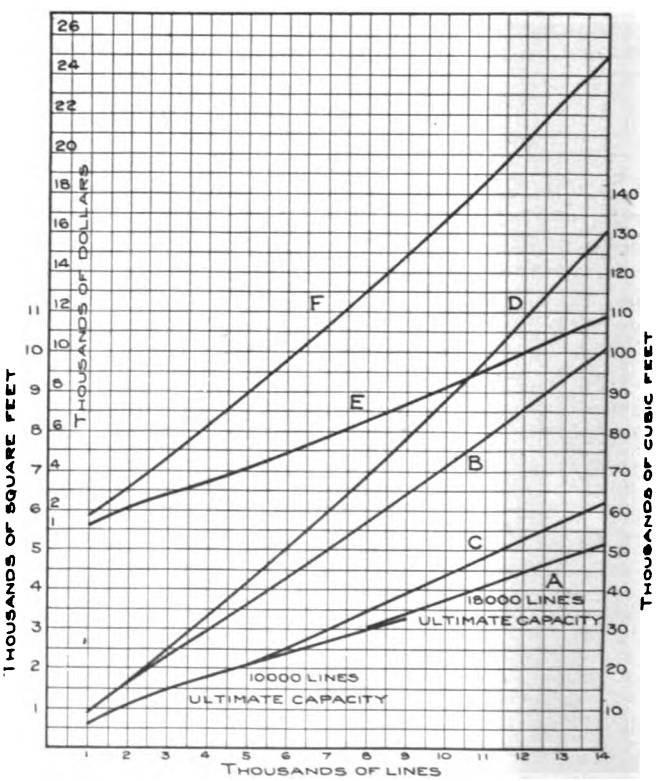

Fig. 6.—Curves Showing Space Occupied by Automatic and Manual Equipments, also Costs of Buildings.

quently it is not customary to make any elaborate provision for their comfort when off duty.

Having now shown what the average costs of the central office equipments and buildings would be in single office plants handling the traffic indicated by curve *A*, Fig. 1, it is next in order to see what effect dividing up a system so that it employs more than one office has on these two items of first cost.

(To be continued.)

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Telephone Companies in Labor Troubles

The published decision of the United States Circuit Court for the Northern District of West Virginia in the case of the National Telephone Company against a number of officers of a labor organization upholds the right of telephone companies to be protected by injunction against the attacks of striking employees. It was charged in the original bill, filed by the company, that a great number of persons formed a conspiracy for the purpose of coercing this and another telephone company, by organizing a strike, and by threats, menaces, and even by assault, prevented others who desired to work from taking their places. It was further alleged that the men actually cut, injured, interfered with and destroyed many of the telephone lines, pursued the company's employees, calling them "scabs" and even assaulting them. One of the defendants, the publisher of a newspaper known as the *Wheeling Majority*, was alleged to have published matter intended to make the preliminary injunction, which was issued, ineffective, and to render a boycott against the company effective. The court held that the defendants had a perfect right to strike, but that they had used unlawful means in attempting to coërce the company; that the telephone business being of a public nature, the rights of the public were involved, and interference with them would not be permitted. The men contended that the liberty of the press was interfered with by an injunction, but the court said it had no intention of interfering with this liberty, and that the press had no right to publish any matter intended to aid wrongdoers in accomplishing a wrongful purpose, or to aid unlawful combinations in making effective an unlawful conspiracy.

National Telephone Company vs. Kent, 156 Fed., 173.

When a Foreman Is a Fellow Servant

The Massachusetts employer's liability act has recently been construed with reference to Telephone companies by the United States Circuit Court. The facts out of which the case arose were as follows: A telephone lineman was engaged with others under a sub-foreman, in stringing new wires. He was upon the cross-arm of one pole holding back two wires, while they were being run over the cross-arm of the next pole. To the end of the wires was tied a rope, and beyond that a piece of insulated wire. The foreman and others were beyond the next pole, pulling the wires over the cross-arm, when the foreman called to the lineman to "let them come." The lineman did so, and the wires sagged and came in contact with highly-charged electric light wires, which ran transversely across the line at the lower level, and he received a shock which caused his injury. There was evidence, from an expert called by the plaintiff, that the method pursued was not usual, nor proper under the circumstances. To use covered or insulated wire instead of bare wire, would have been wiser, in his opinion. This would have prevented danger, and it would be proper to run one wire at a time; the foreman standing in the middle of the street, and instructing the men on the pole so that they would pull the wire along, keeping it taut all the time. The lineman did not know the position of the light wires, and because of intervening trees could not see them distinctly, nor tell whether the insulated wire, the rope, or the bare wires were over the light wires when he was ordered to slack. The foreman in charge of the gang of men, himself, worked at manual labor part of his time, the same as the rest of the men.

Upon this state of affairs, the question arose whether the foreman was one "whose . . . principal duty is that of superintendence, within the meaning of the employers' liability, act, for whose negligence, causing an injury to another employee, the master is liable," and the court held that the fact that he worked with his hands part of the time, did not exclude him from that class, nor excuse his employer from liability on his account. The questions of whether the lineman assumed the risk or was justified in relying on the care of the foreman, and obeying his order, or was negligent in doing so, were held to be questions for the jury, and a judgment for the plaintiff was sustained.

It was also held that a clerk in the office of the district foreman of the company was not, from his position alone, qualified to testify as to the duties of sub-foremen who were under the orders of his chief.

New England Telephone & Telegraph Company vs. Butler, 156 Fed. 321.

Franchise Permits the Erection of Only One Telephone System

Where, under a franchise to that effect, a telephone system is erected, maintained and operated, the function of the grant is fulfilled and the franchise is without life, in so far as the right to erect and operate another and new system is concerned. This was the holding of the Kansas City Court of Appeals in a suit brought by John Eby and another against the city of Lathrop for an injunction to restrain any interference with the plaintiffs in the use of the city's streets and alleys for the erection, maintenance and operation of a telephone system. Eby and Smith, the plaintiffs, were proceeding to construct a telephone system in the city in September, 1905, when they were prevented from doing so by the municipal officers. The plaintiffs claimed the right to construct their system under two franchises, one granted by ordinance number 95 in January, 1900, to W. W. Bain, under the name of the Lathrop Telephone Company. That company erected its telephone system and operated it until January, 1901, after which the franchise was transferred by successive assignments to the plaintiff. The other franchise which the plaintiff claimed was granted by ordinance number 56 to the Clover Leaf Telephone Company in March, 1901. Under this franchise the Clover Leaf Telephone Company, which became the owner of the system built by the Lathrop Telephone Company, operated such system for several years. The court held that the purpose of both franchises had been fulfilled, as a telephone system had been built under franchise number 95 and had been operated under franchise number 56. Therefore the court held that Eby and Smith could not erect a new system under either of the franchises which they held.

Smith and Eby vs. city of Lathrop, 107 S. W., 410.

Injunction Not Granted Ex Parte

In a case growing out of the establishment of rates by the Railroad Commission of Louisiana for the Cumberland Telephone & Telegraph Company, the Federal Court refused to grant a temporary restraining order on an application by the company, alleging that the charges for night and Sunday messages established by the commission were inadequate, and the charges for the use of the cable lines under and across the Mississippi River were unreasonably low. In denying the temporary restraining order, the court decided that temporary injunctions were issued only "where there appears to be danger of irreparable injury" and will usually be used only to preserve the existing situation. Therefore the court did not take into consideration the merits of the case in refusing the application for the temporary restraining order.

Cumberland Telephone & Telegraph Company vs. R.R. Commission, 156 Fed., 834.

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Legal Impediments to Consolidation*

By M. L. Clawson.

It has been held, as regards quasi-public corporations, that the Legislature authorizes a consolidation without the unanimous consent of the stockholders where provision is made for compensation to dissenting stockholders for the value of their stock. This decision was rendered upon the ground that stock in a corporation was subject to the power of eminent domain. Black vs. Delaware Canal Co., 24 N. J. Equity 255. It has, however, been held that equity will enjoin a consolidation, unauthorized, for want of unanimous consent of the stockholders, at the expense of a single dissenting stockholder. Blackford vs. Ress, 54 Barbour 42; Charleton vs. Newcastle Railroad Co., 5 Jur. N. S. 1096; Botts vs. Simpsonville, 88 Ky. 54; 80 Maryland 278; Mowrey vs. Indianapolis, etc., Railway Company, 4 Biss, N. S. 78, 18 N. J. Enquiry 178, 545, 129 N. Y. 57. It has also been held, though contrary to the great weight of authority, that where the amount of dissenting stock is considerable in comparison with the stock of stockowners who have acquiesced in the consolidation, equity may refuse an injunction and merely require security to be given for the payment to the dissenting stockholders of the value of their stock. In McVicar vs. Ross, 55 Barbour N. Y. 247, the judge is quoted: "If the Legislature has no power to force a consolidation when all but one of the stockholders consent, pray tell me where comes the power to force an arbitrary statutory term of consolidation when all object?"

In the case of public service corporations where the Legislature retains the power to alter or amend the charter of a corporation, it may authorize a consolidation without the unanimous consent of the stockholders. But how can it if the power to amend is not reserved?

In the case of Botts vs. Simpsonville, 88 Ky. 54, it was held that the Legislature under the power to amend the charter could not authorize a consolidation without the unanimous consent of the stockholders, where it affects the rights of the stockholders by increasing their liabilities or diminishing the value of their stock.

"It is well settled upon the principles of the common law in this state, and most of the states in the Union, that when a number of persons become members of a corporation for definite objects specified in their charter, which in such case is their contract, and for a time settled by it that the objects and business of the corporation cannot be changed or abandoned or sold within the time specified without the consent of all the partners or incorporators. One partner or incorporator, however small his interest, can prevent it, and this is so although by law a majority in either case can control or manage the business against the will and interest of the minority so long as it is within the scope of the charter."

This rule is founded on the great principle of protecting every man and his property by contracts entered into. Zabriskie vs. Hagensack, 18 N. Y. Equity 178.

The statutes authorizing consolidation generally prescribe the manner in which the consolidation should be effected and, in such a case, as in a case of original incorporation, the essential requisites *must be strictly complied with and especially where the validity of the consolidation is attacked in quo warranto or other remedies* adopted by dissenting stockholders. Does it not follow logically that this would not be true if the state could force consolidation?

The statutes in most of the states, and in some instances the constitutions of the several states, contain provisions prohibiting consolidation of competing public service corporations. This is almost universally true of the several states of this Union. The public policies of the several states are expressed either in organic or statutory law, and these organic clauses and statutory provisions are founded upon the old common law and theory of competition and prevention of monopoly. This feature of public policy is as well grounded, as deeply rooted in our system of legislation, as liberty itself. It is of just as long standing as the charter rights. It is just as firmly founded as the right of free speech. It is absolutely as necessary as the right of private property. Without competition and with monopoly, there can be no such thing as individual proprietorship. Individual ownership, communism or socialism cannot exist in the same place. If power upon the part of the state is given to compel the consolidation of competitive public utility corporations, then the State can force the sale of public utility corporations to the governments. If the government can compel one corporation to sell to another, it can compel the sale of both corporations to itself. If it can compe' the sale of two such corporations to itself, it can in logic and upon principle compel the sale of all corporations to the government without constitutional change or alteration. That this cannot be done within constitutional limitations is obvious.

It is very true that we have handed down from the old common law the principle that whatever is subject to a public interest is subject to public use, but not public abuse. It is also admitted that the principles of law laid down in the case of Munn vs. Illinois, are correct principles of constitutional law, but the power to regulate corporations of public utility functions, the power to prevent discrimination in their conduct, the power to control their business within reasonable limits under their charters, is one principle and this principle is founded upon the correlative theory that the business of the corporation, aside from such regulation, is to be and remain with the corporation; that the title of the corporation is to be in the corporation under the guidance of the directors and managers elected by the stockholders and owners of the corporation.

A contract launching upon the commercial sea is just as valid and binding upon the government and upon the Legislature as it is upon the stockholders. By the charter the stockholder acquires title to his stock. By the charter the stockholder acquires an interest in the assets of the corporation, but the State cannot, if these facts be true, have to itself reserved the power to shift the title at pleasure to depreciate or enhance the value of stock at the caprice of the Legislature, or to force corporations who have invested millions of dollars and whose stock is gilt-edged in the markets of the country, to consolidate with an insolvent rival.

All that is necesary would be to incorporate a fictitious railroad company parallel to a valuable railroad property, then fly to the sheltering wings of a compulsory consolidation statute in order to boost the value of the company's stocks or bonds. There might be one commendable result. It would obviate the necessity of watering stock, and that doctrine would at once give away to the improved method of consolidating stock.

(*To be continued.*)

*Continued from the issue of June 27.

The Convention of Railway Telegraph Superintendents

The annual convention of the Association of Railway Telegraph Superintendents, held at Montreal on June 24, 25 and 26, was particularly noted for the attention given to the problems connected with the adoption of the telephone for train dispatching. The first session was opened on Wednesday morning by President E. P. Griffith. The registration at this session showed a very large attendance, and applications for membership were received from many persons who had not attended previous conventions.

The name of Mr. Wendell Baker, of New York, was presented for honorary membership by Mr. Charles Selden, of Baltimore, and at the time of his election, Mr. L. H. Korty, of Omaha; Mr. F. A. C. Ferguson, of Vicksburg, and Mr. H. C.

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Sprague, of Springfield, Mo., on account of having returned from active participation in railway telegraph work, were also unanimously elected to honorary membership.

Mr. Davis, chairman of the topic committee, reported that he had received very hearty co-operation from the members who had responded willingly to his invitations to prepare papers. The first paper was that of W. W. Ryder, of Chicago, superintendent of telegraph of the Chicago, Burlington & Quincy Railroad, which was published in full in last week's issue of the AMERICAN TELEPHONE JOURNAL. During the discussion that followed, Mr. S. L. Van Akin, Jr., of Syracuse, N. Y., assistant superintendent of telegraph, New York Central Lines, gave the results of some of his experiments with the telephone in dispatching in a very interesting paper, which will be published in a later issue.

Mr. Ryder, after reading his paper, spoke of the rapid strides the use of the telephone has made during the last six months. While the New York Central started its experiments on the main line a little earlier than six months ago, within that period roads which have started to use the telephone for train dispatching and the mileage covered by this service, either in operation or authorized, are as follows:

Illinois Central	2,536
Chicago, Burlington & Quincy	746
Chicago & Northwestern	478
Michigan Central	259
Chicago, Milwaukee & St. Paul	223
Great Northern	202
Northern Pacific	109
Baltimore & Ohio	105
New York Central	95
Lake Shore & Michigan Southern	88
Delaware, Lackawanna & Western	62
Wheeling & Lake Erie	60
Canadian Pacific	49
*Pennsylvania Railroad, lines east	225
*Lake Erie, Alliance & Wheeling	104
	5,674

*Branch lines operated by bridged bells and hand generator signaling.

After this discussion of Mr. Ryder's paper in open session, a brief meeting was held in executive session.

A paper by Mr. O. C. Greene, read by Secretary Drew, gave some suggestions for "Reducing Telegraphing by the Use of Printed Forms." In the discussion of this paper, Mr. Ryder spoke of the desirability of considering the adoption of new standard code letters, on the substitution of the telephone for the telegraph in dispatching. "At the present time," said he, "letters at the heads of report blanks are picked out to facilitate clearness in transmission by Morse. A symbol which is all right for telegraph transmission may be dead wrong for telephone transmission and, in fact, the most serious trouble on the two sections of the Burlington handled by telephone is the possibility of errors in transmitting letters at the head of columns." Mr. Selden suggested that certain columns might be headed with a letter and also the number of the telephone line, so that in transmitting by telephone the number could be used, or the letter if by telegraph. Mr. Ryder saw possibilities of confusion between the number and the information in the column. Mr. Camp suggested that it would be so short to read the whole heading of the column, even if it contained several words, that abbreviation would be unnecessary. One column designation abbreviated from "Burlington Route 34 ft. box" was given as an example of the requirements of some of the roads. Mr. Taylor spoke of the possibility of the use of a code word to head the columns in such a case as this.

When President Griffith exhibited a telegraph dispatch dated 1851, Mr. Selden brought out a hearty laugh by his remark: "Is there any explanation how this delay in transmission occurred?" Another old message was from London bearing the date 1848.

Mr. J. L. Davis read Mr. Fry's paper on "Dry Batteries." This paper covered the results of experiments with dry battery block wire service between Brookfield and Waukesha. Thirty-two cells used failed after three years, meaning an expense of $5.12, against $102 estimated as the first and maintenance cost for three years of 32 cells gravity battery.

An interesting point brought out in Mr. Fry's paper was his method of making a rough test of battery cells by means of a compass. He said: "Place your compass, which may be a small and inexpensive instrument, conveniently near to one or more of the cells, bring a wire from one pole of the battery to the compass, place it on the compass immediately over and parallel with the needle and hold it firmly with one finger. When the needle is quiet, complete the circuit with the wire from the other pole and note the deflection of the needle." By making a few tests, beginning with a battery known to be bad, and working up through several known grades to one known to be in good condition, one can acquire some idea as to the significance of readings to be obtained.

Mr. W. J. Camp, President of the Association of Railway Telegraph Superintendents.

A paper on "Adverse Legislation—Its Possible Ultimate Effects on Telegraphers," by Mr. E. A. Chenery, of St. Louis, was listened to with the greatest attention, and was later discussed by the members in executive session. Mr. Chenery expressed the opinion that recent legislation, both national and state, would tend to demoralize the telegraphers, arouse discontent and stifle ambition. One consequence of this legislation has been the rapid advance of the substitution of the telephone for the telegraph. The telephone is now used for the direct movement of trains on many roads, and others are falling into line. He predicted that within a year's time the telephone will be in service on all the roads. The resulting change in conditions will bring about the employment of young men and young women who will handle the work in their own home towns.

At the Thursday afternoon session Mr. W. F. Williams, of Portsmouth, Va., read a paper on the history of the association, in which he expressed the warm appreciation of the members for the work which has been so ably carried on by Mr. Drew during his many years service as secretary.

Mr. Selden, the second vice-president of the association, when called upon for remarks, spoke of the origin of the association, which was organized after a conversation between himself and Mr. Morley, the first president. The start was unfavorable because it was looked upon as an association formed primarily to influence labor conditions, but as its work has advanced great improvements in the railway telegraph service have been traced to the co-operation made possible by this association, and this co-operation has largely tended to advance the recognition accorded to superntendents of telegraph by other railway officials. A few words were spoken by Mr. William Kline, who was chairman of the first meeting, before a president was elected.

During this session Mr. Griffith announced the election of 25 active members and 16 associate members, more than three times the number of men who met for the first convention in the Grand Pacific Hotel, in Chicago, in 1882.

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Mr. C. S. Rhoads, of Indianapolis, read a very interesting paper on qualifying operators for train dispatching, which brought out a great deal of practical discussion of methods of examining for promotion, following up work to see that routine is adhered to, etc. This discussion was participated in by Mr. Camp and some of his associates in the Canadian Pacific Road, and also by Mr. Ryder.

A paper which was to have been prepared by Mr. Foley on "Moving Trains by Visible Signals" could not be presented, but will appear in the printed proceedings of the association.

The election of officers, held during this session, resulted in the choice of Mr. W. J. Camp, president; Mr. G. W. Dailey, of the Chicago & Northwestern Road, vice-president, and Mr. P. W. Drew was unanimously re-elected secretary.

"Depot Wiring from the Contractor's Standpoint" was the subject of a paper by Mr. J. H. Jacoby, read by Mr. Davis, which gave many useful suggestions. Mr. Selden, in the discussion of this paper, urged that greater care be given to securing safe conditions and neat appearance with respect to entering wires of electric light and telephone companies. Mr. Camp, Mr. Selden and Mr. Taylor joined in the discussion on this topic. Mr. Selden described a plan used for wiring underneath office floors in the B. & O. station at Baltimore. The whole floor is gridironed with wire channels having outlets at the walls. As the channel is made of steel, it is a very easy matter to locate one exactly, either by measurement, or, as a check, by use of a telephone and battery. One pole of the battery is connected to the channel at the wall and one terminal of the receiver, wired in series, is connected to a feeler. The approach of this feeler to the vicinity of the iron channel causes a distinct click to be heard.

The third day's session was opened with a paper by Mr. William Maver, Jr., on "Wireless Telegraphy," tracing in concise form the development of this art up to the present time.

When the committee for formulating methods and conferring with the General Managers' Association was called upon it was announced that a report was not to be presented as the rapid change of conditions has made action unnecessary. It was understood that the change referred to was the rapid conversion to the idea of using the telephone for dispatching which new conditions have worked upon the attitude of the general managers.

A letter from Mr. F. F. Fowle expressed his regret at his inability to attend and present his paper. He was invited to contribute it to the *Proceedings* printed by the association.

The date and place for the next meeting were settled upon as June 23, 24 and 25 at Detroit. A committee on arrangements was made up as follows: Mr. Millington, chairman; Messrs. Marshall, Kinsman, Ashald and William Kline.

The final subject for discussion, which aroused many of the members to very active participation, was the question of determining a standard for high tension and other wire crossing over railroads. A committee was appointed to consider this matter thoroughly. Its members are: Chairman, Mr. G. A. Cellar, Pittsburg; and Messrs. Groce, Dailey, Millington and Selden.

Among the manufacturers who had interesting exhibits of apparatus was the Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y. A complete working system for dispatching trains by telephone, including a selective alarm signal, with an answer-back attachment to record the signaling of the called station at the dispatcher's office, was shown, as well as the new railway iron box telephone, jack boxes, test sets, etc.

The Homer Roberts Telephone Company, 1703 Melrose Street, Chicago, Ill., had a selective dispatching telephone system which attracted considerable attention. By this system stations may be rung selectively, while the control of the line is secured to the dispatching office.

The Sandwich Electric Company, Sandwich, Ill., was represented by its engineer, Mr. H. A. Rugh, who showed the Sandwich selector and telephones for selective signaling dispatching.

The L. M. Ericsson Telephone Manufacturing Company, Military Road, Buffalo, N. Y., had an exhibit of composite apparatus, a small portable set of the military type and its well-known steel telephone.

Among other manufacturers represented were the Duplex Metals Company, 208 Fifth Avenue, New York; J. H. Bunnell & Company, 21 Park Place, New York, and W. R. Brixey, Hudson Terminal, New York.

Practical Questions and Answers*

Sand Trays Under Storage Cells (1030)

What is the purpose of the little boxes of sand which are placed under storage battery cells? I do not see that they insulate the battery any more than glass.

The sand trays are chiefly for the purpose of equalizing the pressure over the bottom of the glass jars. The total weight of the electrolyte, plates and jar itself amounts to considerable, and if no steps are taken to prevent it there is danger of cracking the glass. For insulation, glass or porcelain insulators should be put under the wooden sand trays.

Use of Millivoltmeter for Higher Voltages (1031)

I have a millivoltmeter which reads up to 200 millivolts, and I want to use it to measure the voltage of dry cells and other battery. I have an adjustable resistance box which I want to use as a multiplier, but I do not know the resistance of the millivoltmeter. How shall I tell how much resistance to use and how to figure out the correct voltage?

Using only the voltmeter, a resistance box and a dry cell you can determine the resistance of the instrument by the following method: Let R_0 = resistance of millivoltmeter to be found. Connect the resistance box and instrument in series and unplug plenty of resistance. Attach to the dry cell and put in plugs until the needle comes up to a readable value, perhaps 100 millivolts. Set down the resistance as R_1 and the reading of the needle as e_1, reducing it to volts. (One millivolt = 0.001 volt.) Then insert a few more plugs, so as to raise the needle very much, perhaps to nearly full scale. Record the new resistance as R_2 and the voltage indicated by the needle as e_2. Then the resistance of the voltmeter will be given by the equation

$$R_0 = \frac{e_1R_1 - e_2R_2}{e_2 - e_1}$$

e_1 and e_2 being expressed in volts.

Knowing the resistance of the instrument and approximately the voltage we wish to measure, we can get the resistance to put in series as a multiplier. If E_x is the voltage we are to measure, R_m the resistance of the multiplier and M the highest reading on the scale, then

$$\text{resistance of multiplier} = R_m = R_0\left(\frac{E_x}{M} - 1\right)$$

In using the multiplier at any time to measure battery the voltage read on the scale must be multiplied by the quantity

$$\left(\frac{R_m}{R_0} + 1\right)$$

Measurement of Small Inductances (1032)

What is a good way to measure the inductance of telephone apparatus? I have a box bridge, a resistance box, and a few other pieces of apparatus.

The Anderson-Fleming method, shown in Fig. 1032 is per-

*Replies to queries on this page are furnished by Arthur Bessey Smith, Asst. Prof. of Telephone Engineering, Purdue University.

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haps the best method for your purpose, as it is accurate down to very small inductances, such as are found in the primaries of induction coils. *A* and *B* are the two proportional arms of the bridge, *R* is the rheostat or variable arm, while between X_1 and X_2 is connected the unknown coil of which the inductance is to be found. In place of the galvanometer a telephone receiver is connected, and in series with it a separate resistance box *r*, which is able to give rather high resistance. A condenser of known capacity *C* is connected from between the receiver and *r* to the point between the arms *A* and *B*. *Ba* is the regular battery key found on all bridges. *Sw* is a switch arranged to cut the battery directly to the bridge or to connect

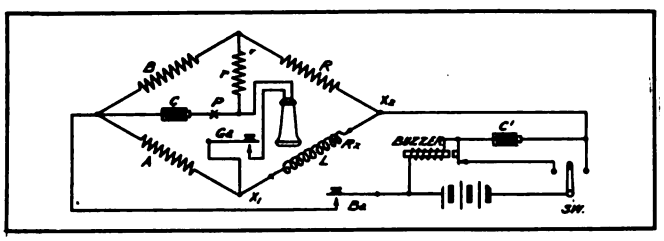

Fig. 1032.

up the buzzer. The condenser *C'* is used merely to keep the battery current where it belongs and will not affect the results.

First balance up the bridge with direct current by throwing *Sw* to the right, closing *Ba* and tapping *Ga*. If you use the receiver to balance the bridge, disconnect the condenser *C* at *P* while so doing. The value of *r* may be zero during this process. If the resistance of the unknown coil is too low to give a good balance, insert some additional resistance with it.

Having adjusted the rheostat until no sound is heard in the receiver, we know that

$$\frac{R_x}{R} = \frac{A}{B}$$

from which the value of R_x may be found, if not known already.

Second, connect the condenser at *P* again, throw *Sw* to the left, starting the buzzer to furnish alternating current, and, with *Ba* and *Ga* both closed, adjust the resistance *r* until no sound is heard in the receiver. When this is done, the inductance *L* of the unknown coil will be

$$L = \frac{CS}{10^6}\left(r + \frac{rP}{Q} + P\right)$$

10^6 is the same as 1,000,000. *C* must be in microfarads, in which case *L* will be given in henrys.

The Use of the Splicing Clamp (1033)

As a beginner in the telephone work, I would like to ask how to use the splicing clamp. Should it be necessary to unclamp it from the wires before completing the splice?

It is very necessary to remove the clamp after making part of the neck and all the close coils on one end. Reclamp on the finished end and twist up the rest of the neck, finishing up with proper number of close coils. If you do not change the clamp, it will leave a parallel place in the neck, and this will have no holding power. If it ever gives, the sudden shock of striking the shoulder will be very likely to break the wire.

Telephone Finances

First Report of Montana Independent

Thaddeus S. Lane, managing director of the Montana Independent Telephone Company, has made his first annual report to the stockholders, and it shows a most gratifying condition as to earnings, growth and local support. The report recalls that the original plan of development included the building of exchanges in Butte, Anaconda, Helena and Great Falls, as well as a connecting toll line system.

Further abstracts are as follows:

The construction of the company's exchange in Butte was begun Sept. 1, 1906, and the exchange was opened for service Sept. 16, 1907, with 225 telephones in operation. The Butte exchange includes a modern fireproof building, an extensive system of underground conduits, in which capacity has been provided for future growth, and a system of underground and aerial cables through which 90 per cent of all telephone service of the Butte exchange is handled. The initial installation consisted of automatic central office equipment sufficient to provide a capacity for 3500 telephones in the city of Butte, and space has been provided in the central office for the installation of additional equipment up to 10,000 telephones.

On June 1, 1908, the number of telephones in service had increased from 225 to 2521, and there were on file 62 unfilled orders. A conservative estimate of the growth of business in the Butte exchange for the ensuing year is an increase of 60 telephones per month, or 720 telephones for the year, representing an increased revenue of approximately $28,000. This will practically put in use all of the present installed central office capacity of the Butte exchange.

The construction of the company's telephone exchange at Anaconda is well under way and will be completed in the month of July. The toll line connecting Anaconda and Butte is about half completed and will be finished during the present month.

At Helena a desirable building site has been purchased, and a quantity of material is on hand for the construction of the Helena exchange which will be rushed as much as possible.

The highest grade of material and equipment obtainable has been used, and both the Butte and Anaconda exchanges represent the most modern development in telephone construction.

The following is a statement of the earnings from Nov. 1, 1907, on which date charges for telephone service began, to June 1, 1908:

PROFIT AND LOSS STATEMENT FOR SEVEN MONTHS, NOVEMBER 1, 1907, TO JUNE 1, 1908, INCLUSIVE.

Gross earnings:		
Telephone rentals	$52,988.16	
Building rentals	109.00	
		$53,097.16
Expense of operation and maintenance	$18,737.29	
Rebates and bad accounts	7,425.80	
		26,163.09
		$26,934.07
Interest on bonds and other interest charges		9,148.68
Net earnings for seven months		$17,785.39
Capital stock outstanding		$209,570.00
Bonds outstanding		330,100.00

The revenues of the company for the month of May, 1908, show an increase over the month of November, 1907, of $3,613.52, or more than 100 per cent increase.

Following is the profit and loss statement for the month of May, 1908:

Earnings:		
Telephone rentals	$8,072.90	
Building rentals	50.00	
		$8,122.90
Expense of operating and maintenance		3,079.04
		$5,043.86
Interest on bonds and other interest charges		2,010.50
Net for month of May		$3,033.36

From this it would seem that the company now has an annual revenue of approximately $100,000, with operating expenses of $40,000, leaving net $60,000 for payment of interest on bonds, sinking fund and dividends on stock.

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Telephone News

Comparison of Telephone Rates at Competitive Points

The Ohio Independent Telephone Association has in the June number of its *Bulletin* invited its members to furnish comprehensive statements of the differences between the Bell and Independent rates, and a summary, in relation with the number of telephones operated by the Independent companies since their organization, which will show, in dollars, the savings resulting from the Independent rates. An example furnished is that of the Columbus exchange, as follows:

BUSINESS TELEPHONES AT $40 A YEAR.

Average number in service Aug. 1 to Dec. 31, 1900, 1968 telephones; yearly saving, $32; total savings for five months, $26,240.

Average number in service 1901, 1902, 1903 and 1904, 2300 telephones; yearly saving, $32; total savings for four years, $294,400.

Average number in service 1905, 2456 telephones; yearly saving, $14; total savings for one year, $34,384.

Average number in service year 1906, 2849 telephones; yearly saving, $14; total savings for one year, $39,886.

Average number in service year 1907, 2295 telephones; yearly saving, $14; total saving for one year, $41,916; total savings, $436,826.

RESIDENCE TELEPHONES AT $24 A YEAR.

Average number in service Aug. 1 to Dec. 31, 1900, 1616 telephones; yearly saving, $18; total saving for five months, $12,120.

Average number in service Jan. 1, 1901, to Dec. 31, 1904, 2530 telephones; yearly saving, $18; total savings for four years, $182,160.

Average number in service year 1905, 2455 telephones; yearly saving, $3; total savings for one year, $7,365.

Average number in service year 1906, 3992 telephones; yearly saving, $3; total savings for one year, $11,976.

Average number in service year 1906, 2849 telephones; yearly saving, $3; total savings for one year, $13,860. Total savings, $227,481.

Saving on both business and residence telephones to close of 1907, $664,307.

The business telephones listed are those of the Citizens' company at its only rate, being for single line, copper metallic circuit, with granular carbon transmitter. The residence telephones listed are of the same class. The Bell rates in Columbus have been of different grades. The difference taken is that between the standard Citizens' rate and what appears to be the typical rate of the Bell company for substantially like service. The Bell company had some rates lower and some rates higher. The rates chosen for comparison are rather under the average. The tabulation, however, does not take into account the possibility of any cut rates. The comparison is on the assumption that the users of Citizens' telephones would have taken Bell telephones at Bell rates, had others not been available. The difference in Columbus is now running approximately $60,000 a year. This is not so far from the amount paid to the Citizens' company for telephones which are duplicated by Bell telephones. With this view of the matter the community, as a community, is not paying anything for its duplicated telephone service.

Louisiana Bill for Telephone Competition Killed in Committee

On June 17 the Senate's corporation committee at Baton Rouge, La., reported unfavorably on Senator Stafford's bill authorizing the people of all cities of over 10,000 inhabitants to nullify the action of City Councils rejecting applications for telephone franchises by a referendum election ordered for that purpose.

The bill was opposed by Mayor Behrman, of New Orleans; C. H. Ellis, vice-president of the Board of Trade of New Orleans, and others. The measure was rejected in committee by a vote of five to four. Senator Stafford warmly defended his bill, stating that the people of New Orleans are eager to vote for telephone competition, and that he has received many letters every day urging him to exert the utmost efforts to have the bill passed.

On receipt of the report of the committee adverse to the measure, accompanied by a minority report in its favor, on June 19, the Senate laid the matter over for consideration at a later date. Among those who have been active in the opposition of this bill is C. H. Ellis, chairman of the committee which prepared a report on the New Orleans telephone situation. In the New Orleans daily papers of June 7 was published a long letter from Mr. Ellis giving his reasons for opposing the bill.

This letter contains some rather vigorous language, as is evidenced by the following quotations: "It is framed so as to serve the private purpose of unscrupulous telephone promoters who were unmasked and driven out of New Orleans." Mr. Ellis further said: "This bill, if passed, will destroy the whole machinery of the city government, and will make futile any inquiries or investigations by commercial bodies or committees of the Council, and will form a precedent for the passage of ill-considered and vicious legislation that can only bring the city into disrepute and retard the investment of capital and do untold injury to commercial and industrial interests."

It seems to be the local opinion that Mr. Ellis has spoken with undue fervor. When he was requested by a representative of the AMERICAN TELEPHONE JOURNAL to substantiate by detailed statements his attack upon the characters and aims of the men who had been endeavoring to procure a franchise to operate an Independent telephone system in New Orleans, no definite expression could be obtained. Mr. Ellis would only say that "under no circumstances would I care to do any injury to anyone, and if I have through any incorrect information done so, nothing affords me more satisfaction than to repair such a wrong."

Telephone Manager Killed by Automobile

At Troy, N. Y., on June 27, a well-known telephone man, Mr. W. Sidney Nicholson, plant superintendent of the Hudson River Telephone Company, living at Albany, was killed in an automobile accident on the Willow Glen Road, about eight miles north of Troy; while his wife, her mother, and Miss Brown, of Albany, were injured.

Mr. Nicholson and his party were speeding along the road when they suddenly met a wagon. Mr. Nicholson turned the machine swiftly to one side in order to avoid a collision with the wagon, but the machine tipped over. He was pinned beneath the car and was crushed to death by its weight. His neck was broken. The injuries to the women were not serious.

Indianapolis Special Committees Recommend Increase in Rates

The Mayor of Indianapolis has received reports from the special committees appointed to investigate the condition of the Indianapolis and New telephone companies, with a view to determining whether relief in the form of permission to increase rates should be granted. The committee has recommended that the desired permission be given. At the present time there is talk of forcing a consolidation between the Independent and Bell companies of Indianapolis, but the AMERICAN TELEPHONE JOURNAL's local representative states that he has the best authority for believing that there will be no consolidation.

An abstract of all the essential points of the reports of the committees will appear in next week's issue of the JOURNAL.

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Independent Telephone Operations in Washington County, Pa.

The new National Telephone Company of Pennsylvania has been doing some work in the central and western part of Washington County, Pennsylvania, and some construction work is being done in the eastern section. When these lines are connected with the National Telephone Company's lines at Washington by the Air Line Telephone Company's trunk lines, Washington County will be well provided with telephone service, as far as trunk lines are concerned.

At the present time there are five Independent companies operating in the field east of Washington. The Home Mutual Telephone Company covers the southeastern part of the county with about 325 subscribers. Adjoining it the Maple Creek Telephone Company, with about 75 subscribers, is giving good service. Both of these companies are adding to their equipment.

The Union Telephone Company, with headquarters at California, Pa., has been in operation for five years and has nearly 375 subscribers with orders from others for telephones. Connection is had with the American Union Telephone Company, at Brownsville, as well as with the other local companies. Its plant is built with the best of material and wires are all copper. The capital stock is $20,000. The company built lines to Roscoe, five miles north, and last March there was organized at that place a small company which took over the lines. At the same time a switchboard was purchased from the then retiring Federal company, and the company was able to start operating at once.

At the same time the Roscoe Telephone Company was organized, the Charleroi Telephone Company was incorporated for $50,000 and construction work started immediately. A complete cable system was installed with 675 pairs of wires running into the exchange. The common battery switchboard has an ultimate capacity of 1200, and over 200 telephones are now connected, with orders for others coming in daily. The company expects to have at least 300 subscribers by next spring.

At the present time plans are being made for lines to Donora, a town three and one-half miles north, where the Pittsburg & Allegheny Telephone Company has a No. 10 B. & S. copper line waiting for connection. Lines south to join with the Roscoe lines are also contemplated.

The Air Line Telephone Company started construction of a line through to Washington early in May and will rush to an early completion. This is the only direct line from the river to the county seat and will be about 20 miles long.

Donora, Monessen and Belle Vernon are about the only towns left without Independent service and the Independent Telephone Construction Company has been organized to build them. Ordinances are pending in all these latter places.

Louisville Court Refuses to Require Sale of New Franchise for Home Company

Judge Gordon, of the Circuit Court, has refused to issue a writ of mandamus against the city of Louisville, Ky., and the members of the Board of Public Works to compel them to advertise the sale of the franchise recently granted by the Council in defiance of the mayor's tardy veto, but claimed to be invalid. Judge Gordon holds that if there had been nothing irregular, or apparently irregular, about the passage of the ordinance, it would still be invalid.

In his opinion Judge Gordon held that the plaintiffs could not sue as taxpayers, inasmuch as their status as taxpayers was merged into their special interest in the ordinance. In the next place, he found that if the ordinance were legally enacted the plaintiffs had never acquired the right, under its terms, to sue in their capacities of special interest. They had not done so for the reason that it was not certain that they would be succesful bidders for the franchise, or, being such, that their bids would be approved by the General Council. The judge also related that the ordinance had been passed for the plaintiff's special benefit, whereas to be legal it should have been passed for the benefit of the public.

The Home company, in spite of his adverse ruling, has strong hopes that after the question has been passed by the Court of Appeals it will be able to secure the relief for which the ordinance was intended to provide.

Independent Toll Lines to Be Built in Kansas

The Home Telephone & Telegraph Company which has recently has recently filed incorporation papers in Topeka, Kan., intends to construct toll lines in the central and south central parts of Kansas. Work is to be started at once on the construction of full metallic copper toll lines connecting Topeka with Wichita, McPherson, Hutchinson and other points in Kansas and Oklahoma. At the present time the Independent telephone companies in central and southern Kansas and Oklahoma have been handicapped in obtaining connections with eastern points. The lines which are now contemplated will give these companies an outlet and connection with thousands of telephones in other parts of these two States.

The headquarters of the company has not been decided upon, but it is quite probable that Abilene will be chosen. The capital stock of the company is placed at $50,000, and the incorporators are: W. E. Burns, Hutchinson; W. P. Hemphill, Topeka, Kan.; C. L. Brown, Abilene, Kan.; C. J. Myers, Kansas City; A. T. Rogers, Beloit.

Special Rates for Long-Distance Service

In line with its action last August abolishing reduced rates on long distance night calls and discontinuing the sale of discount coupon call books, the American Telephone & Telegraph Company is reported to be making a general offer throughout the United States to furnish long distance contract service on a yearly basis at certain hours of the day under the regular rates for individual calls. Between 6 and 10 a. m. and 4 and 9 p. m. the company will make contracts for regular daily service at prices varying according to the hour and distance involved. The offer represents an effort on the part of the company to avoid the concentration of traffic during the busy period of 9 to 4, and to encourage the use of the telephone either before or after these hours, special discounts on contract service are being offered.

Fifty Dollars Small Bait for Weeks

Henry Clay Weeks, of Queens County, Long Island, N. Y., is a friend of the shade trees. Fighting for their preservation has been his pleasure for 12 years, and in that time his natural enemy, the local telephone company, has been prevented from stringing wires along his handsome country place, Vista Lawn.

Four years ago the telephone company obtained an order from Justice Jaycox giving it authority to place four poles on Mr. Weeks' property and string 40 wires thereon. It was stipulated in the order, however, that the company was to pay Mr. Weeks $50 as damages, but from that day to this Mr. Weeks and members of his family have managed to elude this $50.

Lately, when three linemen were arrested for trespass, they were fined $10 each by Magistrate Fitch, of the Flushing Court, who held that, as the $50 had not been paid to Mr. Weeks, the court's order in relation to stringing wires across his place was non-effective.

But now comes Justice Jaycox again, with an additional order, and the telephone company pays $56.26 to John Neiderstein, clerk of Queens County. The rumor is that, as Mr. Weeks had failed in answer to a writ to appear in court and get his $50, this payment to the county clerk would be deemed by the court a fulfillment of its order.

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Lynching Frustrated by Telephone

According to reports from Parkersburg, W. Va., on June 26, some 1000 persons gathered around the jail waiting for the appearance of Charles Brown, a negro, who was to be taken to court to answer a charge of attacking Myrtle Calb, a white girl. Fearing a lynching, however, the authorities had the negro waive examination by telephone.

American Institute of Electrical Engineers Discusses Telephony

The twenty-fifth annual convention of the American Institute of Electrical Engineers was held at the Hotel Traymore, Atlantic City, N. J., during the present week, with an excellent attendance, the registration reaching about 400 by Tuesday. During the past few years the proceedings of the Institute have not contained many papers on the subject of telephony, but the newer conditions in the field seem likely to change this, and to bring into the scope of the Institute work, more frequently, valuable papers and discussions on this important branch of the electrical industry. At the present convention evidence was given of the prospects in this direction by the reading of two important papers, both offered on the first day at the afternoon session. One of these was entitled "A Study of Multi-Office Automatic Switchboard Telephone Systems," by Mr. W. Lee Campbell, a member of the engineering staff of the Automatic Electric Company; and the other, "Wireless Telephony," by Prof. R. A. Fessenden. Publication of the first paper, by Mr. Campbell, has been begun in this issue of the AMERICAN TELEPHONE JOURNAL. Of this paper there was considerable discussion.

Mr. E. A. Mellinger remarked that practically the one argument that could now be advanced against the automatic system was the first cost of the apparatus, which was considerably greater for a single automatic exchange than for a single manual exchange. But Mr. Campbell had demonstrated the entire practicability of subdividing the automatic exchange to an extent not possible with the other type. It was probable that even with a comparatively limited subdivision, from 50 to 75 per cent of the cable required for a single exchange could be eliminated. In view of this fact, first cost became of small importance. There was very little expense in subdividing automatics into branches of 1000 lines or more, leaving only to be considered the slightly increased costs of apparatus and buildings. There could be no doubt as to increase of cost as to the present necessity for separate battery-supplying units, but as to buildings in many instances there would be an actual saving on account of the comparatively low value of the kind of property required for the branch offices. The central exchange was usually in the heart of expensive business districts, and any reduction in space required there would much more than compensate for a corresponding increase in branch office space. It was probable also that less expensive building construction could be employed.

For the small automatic substation in an outlying district it is customary to rent space in some building or erect a small structure to house the apparatus. He mentioned one instance where the substation had been placed underground in a moisture-proof cement vault, like those used in housing batteries in railway signal work. The most logical location was at the manhole where the cable distribution for the district began. The monolith vault, elliptical in shape, provided for such work, 4 ft. 10 in. by 7 ft. 8 in. by 6 ft. in height would accommodate a 100-line unit, with protectors, distributing rack, batteries, etc.

Every city had one or more telephone districts so far removed from the telephonic center that the installation of a substation was an economic necessity. Such districts were being satisfactorily served by trunking stations of from 100 to 500 lines in a number of automatic exchanges. It was more than probable that at no distant date, every large building would have such a substation, trunking to the nearest branch exchange, even though the distance were only a few blocks. From the underground substation to the underground branch exchange was not a long step.

Mr. John Wicks, the superintendent of maintenance of the Home Telephone & Telegraph Company, of San Diego, Cal., commended the paper highly, and said it was hoped that multi-office switchboards would eventually do away with a large part of party line service, without pushing up rentals. A plan had been introduced in an Eastern city for cheaper direct line service. It might be termed "limited trunk" service. Thus if 100 telephones instead of being connected to the main central office by 30 or 40 party lines should be connected individually to a 100 line line-switch in a district station, that station could in turn be connected to the main central office by a number of trunks less than that necessary for furnishing each telephone a trunk line whenever demanded. For instance, the number of incoming and outgoing trunks connected to the line switch unit might each be limited to five, thus making a total of 10 trunks instead of 30 or 40 party lines. It could readily be arranged so that any party attempting to call when all the outgoing trunks from the district station were busy would receive either the usual "Busy" signal, or preferably a peculiar signal, to that effect. A marked virtue of the "limited trunk" service was that communication was absolutely private, thus eliminating one of the most objectionable features of party line service. The possibilities of "limited trunk" service would be enhanced also for residence districts when apparatus was available making two-way trunks practical. It was a well-known fact that the maximum flow of traffic from the residence districts to the business did not occur at the same time as the maximum flow in the opposite direction; so that if the trunks could be used in either direction a less number would be needed. He believed two-way trunking would eventually be made a commercial success.

Prof. A. B. Smith, of Purdue University, hazarded a few doubts as to the completeness of the claimed flexibility of the system in being able to use subscribers' lines for trunks. Would it not seriously interefere with the practice of making trunk cables of lower resistance and electrostatic capacity than subscribers' cables? It would necessitate making the whole installation of cables good enough for trunks, which would be very expensive.

In a multi-office automatic exchange the trunk repeater was used to relay the cable and permit each subscriber to draw talking current from the nearest battery. This introduced further complication in the selecting mechanism, but as far as talking was concerned, a little comparison would show the conditions. In the common battery manual trunk circuit, there are two repeating coils between the two subscribers, one in the cord circuit at the "A" board, and the other in the trunk circuit at the "B" board. No repeating coils are used in the automatic, their place being taken by the condenser-retardation coil combination common in Independent cord circuits. A recent test he had made showed that the repeating coil is considerably less efficient as a transformer of speech than the other combination. Hence the insertion of the trunk repeater into the line would still leave the automatic with an excellent transmission circuit.

Where there are a number of groups of trunks from one office district to another, it seemed that there would be a considerable advantage in making all the trunks more or less accessible to all the offices in that district. If Mr. Campbell said that could be done, the number of trunks could be reduced and there would still be the same busy hour capacity as a whole.

Brief comment in general approval of the paper was made by Mr. L. E. Hurtz, general manager of the Lincoln, Neb., Telephone Company, and Prof. Morgan Brooks.

The paper by Prof. Fessenden on "Wireless Telephony" was a formidable document of no fewer than 76 pages, constituting a classic on the subject. An extended abstract will appear in a later issue of this journal.

This paper was very admirably presented by Dr. A. E. Ken-

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nelly, of Harvard University, in the absence of the author. In the course of his running abstract, Prof. Kennelly said that he had participated in some of the experiments, and that in listening to speech transmitted between Brant Rock and Plymouth, Mass., a distance of about 11 miles, the results were very good. The overtones came better than they did over the line telephone in ordinary every day work.

Much to the disappointment of all present, there was no discussion of this remarkable paper, although it embraced a good deal of matter of an extremely controversial character.

Telephone Patents

TELEPHONIC PROTECTOR AGAINST ELECTROMAGNETIC EFFECTS.

Celio Duó, Buenos Ayres, Argentina, patent 890,850, June 16, 1908.

This invention relates to means for using the same wire simultaneously for telephoning and telegraphing, and protecting the telephone against interruptions due to the telegraph or against other currents or magnetic effects. This is accomplished by means of a coil bearing several windings in opposite relation to one another. Upon a soft iron coil three coils are wound in the same direction, but insulated from each other. A fourth winding, which is a continuation of the third winding, is then put on, but wound in an opposite direction to the other windings. A fifth and sixth winding is likewise put on, being connected to the second and first windings respectively. The conductors of the second and third windings are then electrically connected either through one or two telephones, as desired.

By this method of winding it is claimed the telephone will not be affected by the low frequency telegraph currents, while the voice currents will be readily passed to the receiver.

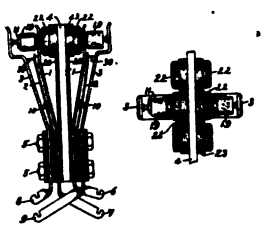
ELECTROTHERMAL PROTECTOR.

Frank B. Cook, Chicago, Ill., patent June 23, 1908.

This patent relates to protectors and protective apparatus for protecting electrical circuits and apparatus from abnormal currents and potentials of electricity. The device consists of a ground plate upon which is mounted a lightning arrester, and a thermally-operatable device.

When an abnormally large current passes through the heat producing or resistance element of the thermal protector 19, such current generally coming over a line spring 1 through the thermal protector 19 to the switchboard spring 3, the heat susceptible material between the casing 11 and cup 19 is softened, allowing the casing to move within the cup. The switchboard spring 3, bearing against the head of the thermal protector, pushes the casing farther into the cup and forces a pin to make contact with the ground plate 4, thus grounding the line spring 1. The objectionable current is therefore diverted from the thermal protector and apparatus connected with the switchboard spring 3. When spring 3 is operated, it also engages contact 30 and operates alarm spring 2 closing an alarm circuit with spring 1 and giving a signal indicating that the apparatus has operated. When it is desired to reset the thermal protector, it is heated either electrically or mechanically and the parts forced back to their normal positions. The heat susceptible material between the cup and casing is allowed to cool, cementing parts 11 and 19 together.

When the thermal protector is set, a high potential current coming in over line spring 1 passes through the dielectric be-



tween carbons 22 and 23 to ground through the ground plate in the usual manner. The thermal protector and apparatus connected to spring 3 are therefore unharmed by this current.

TELEPHONE SYSTEM.

Nathan H. Suren, Highlandville, Mass., patent 891,786, June 23, 1908.

This invention describes a telephone system employing closed call boxes which are used in tunnels or other damp places and where it is desirable that the interior of the boxes be kept dry. To keep the boxes dry, an electrical heating device in the form of a coil or laminated plates is placed in the box in addition to the usual telephone apparatus. A signal lamp is placed outside on top of the box. Both lamp and heating device are operated by current obtained from the lighting circuit, the heating device being constantly in the circuit. The signal lamp is illuminated when a call comes into the box by the action of a relay in the telephone circuit. This relay trips a switch which throws the lamp across the lighting circuit. The switch may be returned to its normal position by hand or by a simple mechanical connection with the door of the box when it is closed after answering the call.

In the Manufacturing Field

Stromberg Carlson Train Dispatching System

Most of the Railway Telegraph Superintendents have had an opportunity to become familiar with some of the features of the Stromberg Carlson telephone train dispatching system at Montreal. Where a telephone line has connected to it selective devices by means of which, without interfering with telephone conversations, the dispatcher may call any point on his division giving a positive signal, the receipt of which is recorded at the dispatcher's office by the operation of an answer back attachment. To operate a selective device and call given local stations, the dispatcher simply inserts a plug in the master machine (Fig. 1) and the closing of the signaling circuit sends out on the line a current which starts the clock work mechanism in the local selectors. Within a very few seconds the necessary contacts are closed at the desired station, and the trip mechanism shown in Fig. 3 is operated.

At this moment a large and powerful vibrating bell operates and the receipt of the call is recorded in the machine shown in Fig. 4 which punches a succession of dots in a moving tape, the number of dots in a group corresponding to the number of the station called.

The apparatus at present on the market is designed to provide 30 stations, as this is the accepted maximum number for a single division of a railway. However, the mechanism may be readily arranged for operating 50 stations if necessary. The 30 station equipment is designed to operate at a two second time interval, that is, it takes two seconds to call a number

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one, four seconds for number 2 and so on up to one minute for number 30.

A valuable feature of this equipment is an arrangement whereby a semaphore may be operated over a circuit so that a signal can be set for a train even if no operator is on hand to take the message, and the operation of the signal will be

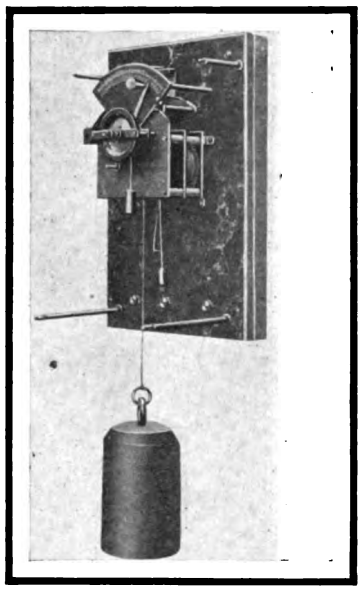

Fig. 1.—Master Station.

recorded at the dispatcher's office. For calling of the stations on the line, it is entirely unnecessary to use the plug and selector so that a general call may be sent out instantaneously.

The mechanism of the selectors does not seem to be overloaded with wheels and springs and numerous contacts likely

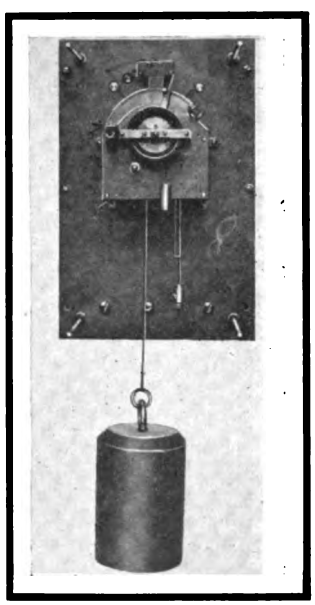

Fig. 2.—Local Station.

to get out of order and so should not present difficulties in maintenance.

The telephones used for this equipment are the type which have been thoroughly tried out in telephone exchanges for both local and long distance work, and are of the highest grade. The system used gives a circuit the advantage of central energy signalling while retaining also the superior transmission which can be obtained for such lines only by the use of local battery talking sets.

FRANK B. COOK, 239 West Lake Street, Chicago, Ill., is supplying his self-welding wire joint to the Department of the Interior, to be used in the construction of the government transmission lines now being installed in connection with the reclamation work in the Northwest and Southwest. The initial order was for the larger size copper joints as follows: For 830,000 C. M. 6-strand cable; 26,250 C. M. 3-strand cable: 41,240 C. M. 3-strand cable. The use of connectors or wire joints with these large sizes of wire or cable is an entirely new departure in the construction of transmission lines. The Reclamation Service is also using both iron and copper joints in Nos. 10 and 12 gages in the construction of its telephone lines. The following are a few of the recent sales: Switchboard protectors: Odessa, Mo., 200 No. 8-1; Edmonton, Canada, 1400 No. 10, 300 extra frame; Strathcona, Canada, 700 No. 10; Ashtabula, Ohio, 1000 No. 10; Lewiston, Me., 200 No. 10; Kenton, Ohio, 1000 No. 10; St. James, Mo., 200 No. 10; Fairbury, Neb., 1000 No. 10; Alliance, Neb., 800 No. 10; Berkeley, Cal., 4000 No. 10; Rochester, N. Y., 8000 No. 10; Guaymas, Mex., 300 No. 10; West Plains, Mo., 500 No. 10; Portland, Ore., 200 No. 8-1; Manchester, England, 120 No. 20. Cable protection: Omaha heads the list with 400 type S-8 which is the number of new Cook protective porcelain terminals. Brantford, Canada, 160 T-22, 24 S-6, 21 J. B. & S-6; Summerville,

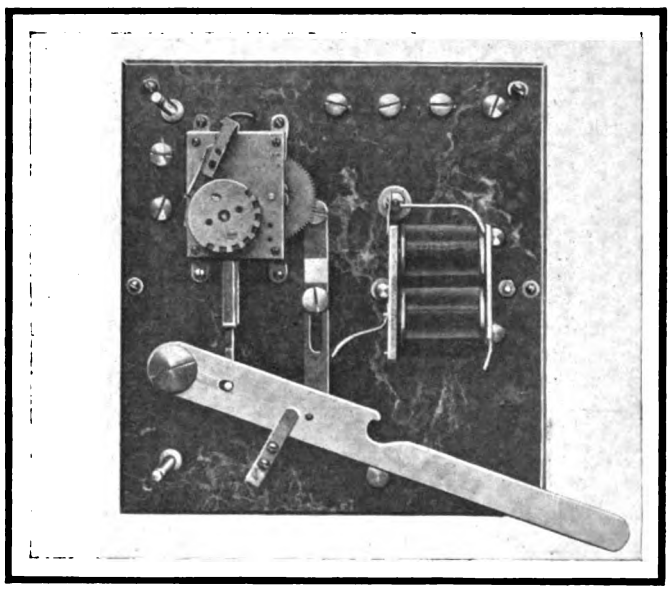

Fig. 3.—Trip Mechanism.

Pa., 16 S-6; Ottumwa, Ia., 14 S. M.; Butte, Mont., 30 S-6; Sullivan, Ind., 6 J. B. & S-6; Green Castle, Ind., 21 J. B. & S-6; Ft. Dodge, Ia., 12 M-4, 13 S-6; Larned, Kan., 6 S-6, 2 J. B., 2 J. B. & S-6; Rochester, N. Y., 6 T. M.; Cincinnati, Ohio, 25 S-6; Millersburg, Ohio, 19 T-4; Emporia, Kan., 7 J. B. & S-6, 1 S-6; Freeport, Ill., 11 J. B.; Waukon, Ia., 6 S-6, 2 M-4, 2 J. B. & S-6; Sulphur, Okla., 1 S. M., 1 J. B. & S. M.; Warsaw, Ind., 5 J. B. & S-6, 2 S-6; Dekalb, Ill., 2 J. B. & S-6; Hotchkiss, Colo., 4 M.; St. Marys, Kan., 2 J. B. & S-6; Arkadelphia, Ark., 3 S-6, 6 J. B. & S-6; Windber, Pa., 22 T-7; Edgar, Neb., 3 J. B. & S-6, 1 S-6; Hamilton, Ohio, 6 S-6; Webster City, Ia., 30 S-6. Substation protectors: Rochester, N. Y., 1000 B-7; Harrisburg, Pa., 1000 B-7; Ottumwa, Ia., 500 B-7; Warrensburg, Mo., 500 B-7; Lincoln, Neb., 500 B-7; Dayton, Ohio, 100 B-7. This seems to indicate that business is picking up in all parts of the country and the outlook is very bright.

THE F. BISSELL COMPANY, of Toledo, Ohio, manufacturers of electrical supplies and machinery, has issued a calendar card for the month of July. The Bissell company states that "it can't possibly hurt you" (very appropriately illustrated by a firecracker) to test their ability to handle your business in a way to meet with your approval by placing an order with them.

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A New Mine and Railway Telephone

A new mine and railway telephone set has recently been placed upon the market by the De Veau Telephone Manufacturing Company, 472 Eighteenth street, Brooklyn, N. Y.

The case of this set is made of cast-iron. The generator and batteries are placed in the back of the box, while the transmitter is mounted on a metal face plate which forms a partition between the generator and the front of the set, as shown in the illustration. The face plate or partition is set upon a rubber gasket and held in place by screws, thus making the case dustproof and water tight.

An interesting feature in this set is that no cords are used with the receiver. As shown in the illustration, the receiver is pivoted to the metal face plate, and can be raised to a position suitable for use. This is a convenience which will be greatly appreciated, as there has been more or less trouble with cords in some sets in which they have been installed. The gongs for signaling are enclosed in a thin sheet-iron casing, which affords ample protection, but at the same time does not appreciably cut down the amount of noise transmitted from the bell to the air.

A saucer-shaped mouthpiece is used on the transmitter; this projects but little beyond the metal face plate, so that there is no annoyance likely to be caused by broken mouthpieces.

The door is closed on a rubber gasket, and is arranged for fastening with a snap lock, which can be opened by an individual or a master key.

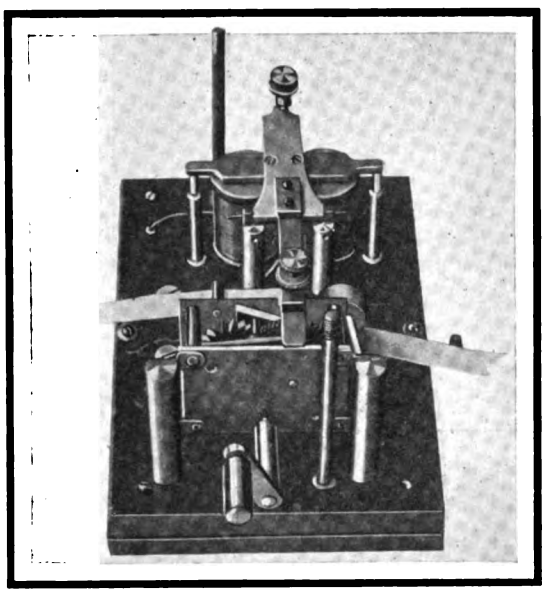

Fig. 4.—Recording Mechanism of the Stromberg-Carlson Telephone Train Dispatching System.

The De Veau Mine and Railway Telephone.

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Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

PERSONAL

MR. RAY JOHNSON has recently been promoted to the position of manager of the Pacific Telephone & Telegraph Company's exchange at Lewiston, Idaho.

MR. H. L. LEE, of Jacksonville, has been appointed general manager of the Ocala Telephone Company, at Ocala, Fla.

MR. ARTHUR BESSEY SMITH, formerly Instructor in Telephone Engineering at Pudue University, has been advanced in grade and awarded the title of Assistant Professor in Telephone Engineering. This is an appropriate recognition of his important services in building up the course in telephone engineering at Purdue University.

MR. L. E. ZIMMERMAN has been appointed manager of the Hesston Rural Telephone Company at Hesston, Kansas.

NEW COMPANIES

STEPHENS, ARK.—Having become dissatisfied with the service being rendered by the Southwestern Telegraph & Telephone Company, a number of citizens of this city have organized an Independent telephone company, and applied to the City Council for a franchise. About two hundred subscribers have already been secured, and work on the installation of a modern system is to be commenced early in July.

EL CENTRO, CAL.—The Home Telephone Company of Imperial Valley has been organized at this city with a capital stock of $50,000, and the following directors elected: Fred Stahl, Brawley; W. A. Edgar, Imperial; Fritz Kolkke, Calexico; George Klein, Heber; Ira Aten, F. S. Webster and R. P. Sheperd, El Centro; J. M. Baldwin, Monrovia, and H. C. Goldrick, of San Francisco. Provision has been made for the construction of 1000 miles of line, and it is possible that an alliance may be formed with the Home Telephone Company of Coachella Valley, which covers the Mecca, Thermal, Coachella and Indio districts. It is stated that work on lines from Redlands to Calexico, and from San Diego to Yuma, will be commenced at a very early date by the new organization.

PAYSON, ILL.—Articles of incorporation have been filed by the Bluff Hall & Payson Telephone Company. It has an authorized capital stock of $1,050, fully paid up, and contemplates the installation of an exchange and the construction of a number of farmers' lines.

LEESBURG, IND.—A new telephone company is being organized at this city by J. E. Armstrong and Walter Stanley, owners of the Wilmot & North Webster Telephone Company. It is the purpose of the promoters of this enterprise, if possible, to purchase the properties of the Royal Telephone Company and the Stony Point Mutual Telephone Company at this city, reconstruct the old lines and install a new exchange. In the event of failure on the part of the organizers to effect such a sale, it is planned to install an entirely new plant. It is stated that about 150 of the leading citizens of Leesburg have signified their intention of supporting the enterprise.

LAKE MILLS, IA.—An Independent telephone company has been organized at this city by a number of the leading business men, and plans are being made for the installation of an up-to-date system. It is to be capitalized at $5,000, and the following officers and directors have been elected: Ole Grove, president; L. J. Molland, vice-president; John Horvei,

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secretary; O. N. Styve, treasurer. The directorate is composed of the above named officers and J. C. Williams, Ed. Henderson and H. H. Dorland.

HARBOR SPRINGS, MICH.—A farmers' telephone company has been formed by residents of Friendship and Redmond townships, and the following officers elected: David Vorce, president; John Mathews, secretary; David Johnson, treasurer. Its plans include the operation of a line between Harbor Springs and Stutsmanville, and forty subscribers have already been secured.

PORT HURON, MICH.—An Independent telephone company, to be known as the Home Telephone Company, is being organized at this city. Among those most actively interested in this project is John M. Gleason, who, in connection with George A. Donlin, L. E. Farnum and Frank Gribling, recently applied for a franchise at Port Huron. The company's plans include the establishment of a telephone system in St. Clair, Marine City, Algonac, Fair Haven, Emmett and other parts of St. Clair County.

CLARA CITY, MINN.—Articles of incorporation have been filed by the Aheiderland Telephone Company, which intends to construct, maintain and operate rural telephone lines. It is capitalized at $10,000, and I. F. Kray is one of the incorporators.

KILKENNY. MINN.—The Kilkenny & Cordova Telephone Company has been organized, and contemplates the installation and operation of a telephone system at this city.

CHILLICOTHE, MO.—The Livingston County Mutual Telephone Company, which was recently organized, has filed articles of incorporation, the capital stock being placed at $15,000.

LOUISVILLE, NEB.—An Independent telephone company, to be known as the Farmers' Co-operative Telephone Company, has been organized by the farmers west of Louisville, and work on the installation of its plant is to be commenced at once.

PATERSON, N. J.—From this city comes news of the incorporation of the recently organized Oakland Land & Improvement Company, whose plans include the construction and operation of a telephone system. It has an authorized capital stock of $200,000, and the incorporators are: James M. Stout, 96 Fulton Street, New York; William Gage, 109 West 102d Street, New York, and Nathaniel N. Broughton, Hackensack.

ELMIRA, N. Y.—Announcement is made at Elmira that an Independent telephone company, to be conducted on a co-operative basis, has been organized by the farmers in the western part of the county, and that lines giving service to Bohemia and west of that locality have already been erected.

PAVILION, N. Y.—Articles of incorporation have been filed by the Pavilion Telephone Company, whose intention is to construct and operate a telephone system in this city. It is capitalized at $10,000, and the incorporators are: Bert J. Berad, Pavilion, N. Y.; G. Dean Hudson and Horace S. Bradley, Wyoming, N. Y., and others.

WOOSTER, O.—The Wayne County Telephone Company, whose principal place of business is to be located at Wooster, has been organized. This company, which is to have a capital stock of $10,000, the shares being worth $25 each, will probably take the place of the Farmers' Union Telephone Company at Orrville, plans for the formation of which were recently discussed at that city. The organization of the Wayne County Company has been brought about by the dissatisfaction caused over rates charged by the local company at Wooster and Orrville, and a new system between these two cities is to be installed.

BIGHEART, OKLA.—The Bigheart Telephone Company, which is capitalized at $2,000, has filed articles of incorporation. Among those responsible for its formation are: D. J. Dunham, J. L. Cosden, J. D. Mandeville, E. T. Gibson and others.

LENTS, OREGON.—A farmers' telephone company has been organized for the purpose of connecting Christilla Valley with Lents. A good part of the system has been built, and an exchange is soon to be installed at Lents. It is the intention of the owners of the system to eventually extend it throughout Clackamas and Multnomah counties.

ANNVILLE, PA.—The North Annville Rural Telephone Company has been organized, and the following officers elected: President, Cyrus Boger; treasurer, S. W. Heilman; secretary, J. A. Long. About eight miles of line have already been erected, and the company is planning to extend its system to McGillstown and other points, and to establish connections with the American Union Telephone Company at Annville.

MILLWAY, PA.—The Millway & Rothsville Rural Route Telephone Company was recently organized at a meeting of East Warwick business men and farmers, held at Rothsville. It proposes to operate lines in Ephrata, Lititz, Millway and other places. Those interested in the new enterprise are H. Walters, of Rothsville, who is to be general manager of the company, Noah Hess, Rothsville, and others.

SCHUYLKILL HAVEN, PA.—It is probable that a new telephone system will be installed at this city at no very distant date. An Independent company is being formed, fifty-eight subscribers have been secured and exchange quarters selected. Owing to the hearty support being extended by the business men of this town, the success of the enterprise is well assured.

KIMBALL, S. D.—Articles of incorporation have been filed by the Cleveland Smith Telephone Company, which proposes to install and operate rural telephone lines throughout Brule County with headquarters at Kimball. It has an authorized capital stock of $5,000, and the incorporators are: A. L. Carey, P. D. Brady, Batt Ryan and others.

DUCKTOWN, TENN.—Incorporation papers have been filed by the Mine City Telephone Company, which proposes to construct, maintain and operate a telephone system at Ducktown and throughout Polk county. The capital stock is placed at $500, and the incorporators are: J. M. Kilpatrick, Carl Center, C. M. Campbell, W. S. Love and W. I. Morris.

McMINNVILLE, TENN.—Articles of incorporation have been filed by the Citizens Telephone Company of McMinnville. It has an authorized capital stock of $5,000, and contemplates the construction and operation of a telephone system from McMinnville to the following cities: Tracy City, Beersheba, Spencer, Sparta, Smithville, Woodbury, Nashville and Manchester. The incorporators of the new company are: James Walling, Butler Smith, J. M. Lively, A. H. Faulkner and J. J. Morford.

VIOLA, TENN.—The Viola Telephone Company, whose plans include the construction and operation of a telephone system throughout Warren county, with an exchange at Viola, has been organized at that city. The capital stock is given at $5,000, and the following officers have been elected: E. W. Smartt, president; Frank P. Blue, vice-president; Lionel D. Ramsey, secretary-treasurer and general manager.

LAMPASAS, TEX.—An Independent telephone company has been organized at this city, and work on the construction of a rural system is to be commenced at once.

PROSSER, WASH.—The Benton Independent Telephone Company, which is composed mostly of farmers, has completed its organization by the election of the following directors: I. W. Carter, T. J. Stockdale, J. H. Hoagland, C. E. DeBow, R. H. Bone, J. T. Jackson, D. T. Smith, and George C. Lincoln. Work on the installation of an exchange at Prosser is to be commenced very shortly.

INDEPENDENCE, WIS.—Articles of incorporation have been filed by the Independence Telephone Company, of Independence, Trempealeau county. It has an authorized capital stock of $8,000, and the incorporators are: C. H. Short, Frank Wise, Peter Skroch, F. C. Cripps, A. J. Bautch, B. Brethauer and others.

MALLORYTOWN, ONT., CAN.—The Mallorytown Independent Telephone Company has been incorporated for the purpose of installing and operating a local telephone system. The incorporators are: C. E. Tennant, E. I. Mallory and A. H. Judson.

MOLESWORTH, ONT., CAN.—The Molesworth Telephone Company has been organized and has constructed a line to Listowel, where connections have been established with the exchange at that city. Additional lines are to be erected.

TILBURY, ONT, CAN.—At a meeting held at this city a few days ago a rural telephone company was organized to operate in the counties of Essex and Kent. The company is to be called the Farmers' Consolidated Telephone Company, and the following provisional directors have been elected: W. C. Crawford, J. S. Richardson, Dr. Knister, Dr. McCoil and H. J. Beuglet.

HUMBOLT, SASK., CAN.—Articles of incorporation have been filed by the Humboldt Electric Light, Power & Telephone Company, which proposes, among other things, to construct telephone lines.

FRANCHISES

SYCAMORE, ILL.—An ordinance granting a franchise to the Exchange Telephone Company was recently passed at a special meeting of the City Council. This ordinance requires that the construction of the system shall begin within six months, and be in successful operation within one year. Provision is also made for supplying five telephones free for city use, and for a 25 per cent reduction in rates for such additional ones as may be required.

HOPE, IND.—A telephone franchise at this city has been secured by the Central Union Telephone Company, which proposes to install an exchange and construct an up-to-date telephone system.

GARDEN CITY, KAS.—The People's Mutual Telephone Company has been granted a franchise to construct telephone lines in Garden City.

MAYSVILLE, KY.—At a recent meeting of the Fiscal Court at this city a franchise for the construction of a private telephone system was granted to B. F. Erisloe, of Huntington, West Va.

STURGEON LAKE, MINN.—Permission to install and operate a telephone system in Sturgeon Lake has been granted to the Pine County Telephone Company.

BROCKET, N. D. The recently organized Brocket Farmers' Telephone Company has secured a franchise to install and maintain an exchange at this city.

SOMERSET, O.—An application for a franchise to operate a telephone plant at this city has been presented by T. J. Smith, of the Citizens' Independent Telephone Company, of New Lexington, L. B. Chester, also of that city; C. E. Hollander, of Newark; J. C. Smith, Lancaster, the reason assigned for this petition being that Independent subscribers in the towns mentioned, and other places, have been urgent in their requests for Somerset service. The franchise is asked for in the name of the

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Newark Telephone Company, and provides that work shall be commenced within 90 days after the granting of the franchise, and that the equipment shall be installed and in operation by January 1, 1909. The petitioners promise that, if they are successful in obtaining the desired privileges, about $20,000 will be expended in the installation of a thoroughly modern plant.

AMARILLO, TEX.—A permit to operate in Texas has been granted to the Panhandle Telegraph & Telephone Company, which was recently incorporated under the laws of the State of Arizona, with its main office at Amarillo, by H. H. Davenport, M. C. Lemaster, J. T. Harrison and others.

HONOLULU, H. I.—It is understood that the Standard Telephone Company intends to apply for a new franchise in case the extension of time in which to install its system is not granted, and that a reorganization of the company is to be effected.

FINANCIAL

REDDICK, ILL.—The Reddick Mutual Telephone Company, after liquidating all its indebtedness, has declared a dividend of $1 on each share of its stock.

NEW YORK, N. Y.—The directors of the New York & New Jersey Telephone Company at a recent meeting declared the regular quarterly dividend of 1¾ per cent, payable July 15 on stock of record of July 6.

COLUMBUS, OHIO.—The Columbus Citizens' Telephone Company has declared its regular quarterly dividend of 1½ per cent on the preferred stock of the corporation, payable July 1.

NORWALK, OHIO.—At a recent meeting of the directors of the local telephone company, which operates in Norwalk and Bellevue, the usual dividend of 1½ per cent was declared on the preferred stock, and a dividend of 1 per cent on the common stock, both payable July 1. This is the first dividend ever declared on the common stock, and much gratification was expressed by the stockholders that the company's earnings now warrant placing the common stock on a dividend paying basis.

PATASKALA, OHIO.—The capital stock of the Pataskala Farmers' Telephone Company has been increased from $10,000 to $30,000, and it is expected that many improvements in its system will be made.

MONTROSE, PA.—At the annual meeting of the Northeastern Pennsylvania Telephone Company, at which W. C. Norton, of Wayne County, was elected chairman, and F. T. Gelder, of Forest City, secretary, it was unanimously decided to impose an assesment of $3 per share on the stock. This action, it is said, will place the company on a very sound financial basis.

PHILADELPHIA, PA.—The regular quarterly dividend of 1½ per cent, payable July 15 to stock of record of July 3, was recently declared by the directors of the Bell Telephone Company of Pennsylvania.

PORT ALLEGANY, PA.—At a recent meeting of the directors of the Centre Hall and Linden Hall Farmers' Telephone Company, which is a branch line of the Patrons' Rural Telephone Company, it was decided to declare a 5 per cent dividend on its stock for 1907. the previous year's dividend having been but three per cent.

ATHENS, WIS.—The Athens Telephone Company, of this city, has increased its capital stock from $6,000 to $10,000, and expects to use the money in the extension and improvement of its system.

CONSTRUCTION

GROVER, COLO.—Plans are being discussed by the Grover Farmers' Institute for connecting Grover with Greeley by telephone.

WATERBURY, CONN.—The Southern New England Telephone Company is rebuilding portions of its toll lines between Waterbury and Danbury. Upon the completion of this work it is the company's intention to install a new toll line between Waterbury and Newton.

WASHINGTON, D. C.—Two new exchanges have been opened by the Chesapeake & Potomac Telephone Company at this city, one, known as the Columbia, will accommodate subscribers north of Florida Avenue, east of Rock Creek and west of North Capitol Street; the other, named the Cleveland, will serve subscribers in the suburbs of Cleveland Park, Chevy Chase and Tenyeltown.

DONNELLSON, ILL.—Property has been purchased at this city by the Montgomery County Telephone Company, in which it proposes to install its local exchange. The company is also making many improvements in its system in other towns.

BOONVILLE, IND.—The Chandler Telephone Company, which was recently granted a franchise at this city, intends to install a modern exchange and establish connections between Luce township and Ohio township. The company also promises service to Indianapolis and Louisville.

CLEAR LAKE, IA.—A new switchboard has been installed at this city by the Clear Lake Independent Telephone Company, and many other extensions and improvements in its system are planned.

IOWA CITY, IA.—Work on the new copper circuit to Des Moines which the Johnson County Telephone Company is building is progressing rapidly, and the company is also making some improvements in its local system at Iowa City.

IOWA CITY, IA.—The exchange quarters of the Iowa Telephone Company are being enlarged to take care of its increased business.

LEROY, IA.—The Independent Telephone Company, of Richville, is installing a new exchange at Leroy.

LUANA, IA.—A new switchboard has been installed at this city by the Farmers' Telephone Company, and other improvements are being considered.

OSKALOOSA, IA.—The additional construction work planned by the Home Telephone Company at this city will represent an expenditure of $20,000.

OTTUMWA, IA.—It is the intention of the Home Telephone Company to expend about $50,000 in the improvement of its plant at this city.

SCHALLER, IA.—Connections with the lines of the Farmers' Companies of Odebolt and Early are being established by the Farmers' Telephone Company of this city.

GRAND LEDGE, MICH.—The Citizens' Telephone Company has under consideration many improvements in its plant at Grand Rapids.

HILLSDALE, MICH.—Plans are being considered by the Southern Michigan Telephone Company for the installation of a strictly modern telephone plant at this city, similar to the one which has already been established at Coldwater.

JACKSON, MICH.—Work on the installation of a private telephone line for train dispatching between Jackson and Detroit has been commenced by the Michigan Central Railroad. It is said to be only a matter of time when the entire Michigan Central road will be equipped with a telephone system.

MONTAGUE, MICH.—It is estimated that about $10,000 will be expepnded by the Lake Shore Telephone Company in the construction work it has planned to do at Montague. Many improvements in its plant at Pentwater are also to be made.

SAGINAW, MICH.—The Saginaw Valley Telephone Company expects to have a new up-to-date plant in operation at this city early in September.

BATTLE LAKE, MINN.—Work on the installation of a new exchange at this city and the construction of about forty miles of rural line is soon to be undertaken by the Battle Lake Mutual Telephone Company.

ERSKINE, MINN.—New lines into Erskine and Winger are being erected by the Garden Valley Telephone Company, and arrangements discussed for effecting connections with Fosston and a number of other places.

FLOODWOOD, MINN.—An exchange building is to be erected at this city by the Floodwood Telephone Company, in which a modern exchange is to be installed.

GRAND RAPIDS, MINN.—It is the intention of the Duluth Telephone Company to remodel its exchange at this city. A new switchboard is to be installed, and it is understood that several thousand dollars will be expended upon the work.

MENAHGA, MINN.—A telephone exchange which will accommodate about thirty-five subscribers is being installed at this city by the Menahga Telephone Company.

OWATONNA, MINN.—The construction of a line between this city and Deerfield is one of the extensions contemplated by the Northwestern Telephone Company.

VINELAND, MINN.—The Kathio Independent Telephone Company is planning for the construction of a line from Vineland to Onamia.

BILLINGS, MONT.—The Mutual Telephone Company is soon to commence the installation of new exchange equipment in the building which is now being erected for it in Billings.

JOPLIN, MO.—Work on the construction of a new exchange building at this city has been commenced by the Missouri & Kansas Telephone Company. Entirely new equipment is to be installed in it, and it is stated that in the neighborhood of a quarter of a million dollars will be expended before the work is completed.

MARYVILLE, MO.—At a recent meeting of the directors of the Farmers' Telephone Company plans were discussed for materially improving its plant.

AVOCA, NEB.—A line between this city and Unadilla is being erected by the Farmers' Telephone Company, and other extensions are being considered.

SOCORRO, N. M.—It is stated by T. J. Mathews, manager of the Socorro County Telephone Company, that work is to be commenced at once on the construction of a line to Elephant Butte, and that as soon as possible connections are to be established with El Paso.

HENDERSON, N. C.—The Home Telephone & Telegraph Company, which has just completed the construction of a new forty-mile toll line extending from New Bern to Pollocksville, White Oak Camp, Maysville and Dieppe, expects to extend its system to Jacksonville, the county seat of Onslow county.

ROCKY MOUNT, N. C.—The installation of a new common battery exchange at this city has just been completed by the Home Telephone & Telegraph Company, and other improvements are being considered.

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Condensed News Reports

BISMARCK, N. D.—Among the extensions planned by the North Dakota Telephone Company are long distance lines to Brittin, Braddock, Kintyre and Napoleon.

ASHTABULA, O.—The Ashtabula Telephone Company is installing a new exchange at this city.

CLINTON, O.—Connections are soon to be established between the lines of the Clinton Telephone Company and the new Fayetteville Telephone Company, which will give direct communication to Clinton and Brown counties.

CONESVILLE, OHIO.—The lines of the Cincinnati & Suburban Bell Telephone Company between this city and Franklin are being thoroughly overhauled.

MARSHFIELD, OHIO.—Additional lines to Athens are being constructed by the Citizens' Telephone Company.

PIEDMONT, OKLA.—The Canadian Valley Telephone Company, which has already installed about four hundred telephones in the farming district in the vicinity of El Reno, is constructing a line from Piedmont to Edmond.

BIRDSBORO, PA.—Many improvements are being made by the Conestoga Telephone Company at this city in order to take care of its increased business.

CANTON, PA.—The completion of a line from Shunk to Canton opens up an important field to the Sullivan County Telephone Company. This line, with the Loyalsock line, gives the people of Canton communication with Williamsport over an Independent line, the business having previously been transacted over the lines of the Bell Company. Other extensions are planned by the Sullivan County Company.

PECKVILLE, PA.—A new exchange is to be installed at this city by the Consolidated Telephone Company, which is also planning to further extend its system.

MANNING, S. C.—Arrangements are being made by the Southern Bell Telephone & Telegraph Company to establish a long-distance line connecting Manning with the main line at Pinewood.

ANGLETON, TEX.—An Independent telephone line from this city to Phair, a distance of about eight miles, is being erected by the farmers in this vicinity.

ST. ALBANS, VT.—The Franklin County Telephone Company is considering the advisability of building a number of rural lines into the surrounding country, the need for a rural telephone service having been discovered by Manager E. J. St. Clair during a recent visit to that section.

SPOKANE, WASH.—The Interstate Telephone Company, which has just completed the construction of a line into Wallace, is planning for the erection of a line from Spokane to Lewiston, taking in all of the important towns of the Palouse country en route, and incidentally entering into competition with the Pacific States Telephone & Telegraph Company in that territory.

MILWAUKEE, WIS.—The Wisconsin Telephone Company contemplates the erection of a number of new toll lines in Southewestern Wisconsin. Among these may be mentioned lines connecting Waukesha, Eagle and the Lake Geneva section with the new underground lines between Milwaukee and Chicago at Racine.

NAPINKA, MAN., CAN.—A meeting was recently held at this city to arrange for the construction of a municipal telephone system throughout the Municipality of Brenda, with switchboards at Waskada, Goodlands, Napinka and Medora. The proposed system will cost about $35,000. Address Reeve Innis, Napinka, Man., Can.

DRINKWATER, SASK, CAN.—The Western Saskatchewan Telephone Company is making arrangements to build a line between Drinkwater and Belle Plaine.

ELECTIONS

GARFIELD, MINN.—At the annual meeting of the Farmers' & Merchants' Co-Operative Telephone Company the following officers were elected: Peter Hanson, president; P. A. Peterson, vice-president; Ole J. Berg, secretary; Chas. W. Kloehn, treasurer. The above named officers and John C. Johnson constitute the board of directors.

LITCHFIELD, MINN.—The Litchfield Telephone Company at its annual meeting elected: President, H. J. Peterson; vice-president, C. P. Winman; secretary, T. F. McClure; treasurer, G. A. Settergren.

HEWITT, MINN.—At a recent meeting of the Hewitt & Wrightstown Telephone Company, at which time it was decided to install a new switchboard at Wrightstown, the following officers were elected: President, Alfred Naylor, of Bertha; vice-president, L. D. Lufquist, Henning; secretary, A. A. Birch, Wrightstown; treasurer, B. R. Bartlett, Hewitt.

BETHEL, PA.—The following directors have been elected by the newly organized Bethel & Mt. Aetna Telephone Company: A. A. Spannuth, Harry R. Miller, Joseph F. Schlaseman, R. I. Frantz, Morris W. Fisher, Emmanuel Merkel and D. W. Ensminger.

PLANKINTON, S. D.—At a recent meeting of the directors of the Plankinton Telephone Company the following were elected members of the executive committee: W. T. Lathrop, Gus Steinfeldt, E. F. Mackey, W. C. Harris, W. G. Groves, M. Gales and S. H. Bakewell. The advisability of issuing more stock, to secure funds for building additional country lines, was also discussed.

MISCELLANEOUS

DOTHAN, ALA.—Arrangements have been effected between the Standard Telephone Company and the Lanier Telephone Company of Hartford, whereby the two companies will work in conjuction in the future. Two circuits from Dothan to Hartford and all points west are to be maintained hereafter, and a much better service is promised.

WASHINGTON, D. C.—Fifty employees of the Chesapeake & Potomac Telephone Company at a recent meeting organized an association, the objects of which are educational and social. At future meetings papers on technical subjects pertaining to the telephone business will be read and discussed.

GAINESVILLE, FLA.—Commenting on the telephone service in connection with securing returns at the Florida June primary, the Gainesville *Sun* said: "The *Sun* desires to extend thanks to the East Florida Telephone Company and its operators in this city for the efficient service rendered in securing returns from the country districts in Tuesday's primary."

DES MOINES, IA.—The plants of the Mitchellville Telephone Company and the Farmers' & Merchants' Telephone Company, of Prairie City, owned respectively by B. J. Carne, of Grindell, and C. C. Keister, of Marshalltown, have been acquired by the Iowa Telephone Company, of Des Moines. The two systems give service to about 1,000 subscribers.

TRAER, IA.—A deal has recently been consummated whereby a syndicate of Traer citizens' and a few of Waterloo, represented by C. A. Pratt, of Traer, has purchased all of the properties of the United Exchange Company in Traer.

BUTLER, KY.—The property of the Independent telephone company, consisting of lines in Kenton, Campbell and Pendleton Counties, with exchanges at Butler, Falmouth and Grant's Lick, formerly owned by S. P. Kineon, has passed into the possession of U. J. Howard, the consideration being in the neighborhood of $2,400.

HOWELL, MICH.—The stockholders of the Mutual Telephone Company, at a recent meeting, voted down the proposition to take over the exchange of Michigan State Telephone Company.

SWEET SPRINGS, MO.—A controlling interest in the Sweet Springs Telephone Company has been acquired by R. Sam Hays, H. Renken and J. R. Smith.

LODGE POLE, NEB.—The Lodge Pole Telephone System has passed into the possession of C. F. Mettey, who intends to make many improvements and extensions.

POTTSVILLE, PA.—Through a recently consummated deal the American Union Telephone Company has secured possession of many new miles of telephone lines formerly the property of the United Telegraph & Telephone Company. In addition to this, the American Union Company has leased the lines of the Friedensburg, McKeansburg and Ringtown companies, which puts it in control of all commercial lines in Schuylkill County, with the exception of those of the Pennsylvania Telephone Company.

LEXINGTON, TENN.—The name of the new Independent telephone company at this city has been changed from the Home Company to the Henderson County Independent Telephone Company, and the following officers have been elected: President, E. L. Fesmire; vice-president, W. T. Watson; secretary and treasurer, H. E. Graper. A modern telephone system is to be installed at Lexington at once.

BELLEVUE, TEX.—A certificate of dissolution has been filed by the Bellevue Mutual Telephone Company.

EPHRAIM, UTAH.—On account of the threatened discontinuance of free county service by the Rocky Mountain Bell Telephone Company, a committee, composed of H. P. Peterson, E. A. Britsch, Ephraim Hanson, J. Y. Jensen and P. C. Anderson, has been appointed to investigate the cost of installing a new system.

UNDERGROUND

WILMINGTON, DEL.—Considerable additional conduit work is to be done by the Bell Telephone Company of Pennsylvania at this city.

BOONEVILLE, IND.—It is the intention of the Chandler Telephone Company, which was recently granted a franchise at this city, to place all of its wires underground in the business section of the city.

MUSKEGON, MICH.—Permission to install a conduit system in this city has been granted to the Citizens' Telephone Company.

DULUTH, MINN.—Official notification has been received by the council of this city that the Duluth Telephone Company will in a few days remove certain telephone poles, and place its wires in conduits. It is estimated that this change will cost in the neighborhood of $50,000.

OKLAHOMA CITY, OKLA.—The Pioneer Telephone & Telegraph Company is placing some of its wires underground in this city.

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FOR SALE

This column is open only to operating companies to sell telephone plants or second-hand apparatus. The rate for advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

FOR SALE.—A few thousand 1½x9 inch pins at $8 per thousand. First-class goods; no seconds. Speak quick. J. J. DOMSER, Lowville, N. Y. 1130

POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED. — By cable splicer. Wheatstone bridge work a specialty. Competent to take entire care of switchboards, cable, lines and instruments. Have also had experience as manager, construction foreman and wire chief. Can save you money in your maintenance and operating departments. Address Box 1132, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

A MAN of 30 with thorough knowledge of the telephone business, who possesses the necessary executive ability to manage and handle men, and has had several years' experience in the engineering, construction and maintenance departments of large telephone companies, whose technical training has been gained from the cold, hard knocks of experience, who is broad minded enough to weigh others men's ideas and profit by them, who has served time as troubleman, chief clerk, inspector, engineer, etc., and understands the laying out of subway and cable construction, pole lines, block distribution and can estimate and make intelligent drawings on construction and reconstruction work of all types, and do a whole lot of other things to earn a respectable salary—"That's me." Write and ask me to "prove it." Address Box 1111, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED. — Party employed, having full charge of subscription department, desires similar position with firm doing large business in poles and posts. Can take full charge. Good references. Will want big salary. Address, Box 1107, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—By technical graduate, five years' experience with large Bell company. Specialty, successful exchange and plant mantenance. Please address Box 1133, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED

The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.

HELP WANTED

The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone and electrical supply salesman to carry our side line. Vest pocket sample. Address Box 1131, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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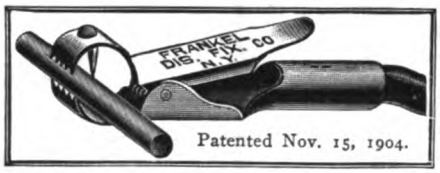
SHORT CUTS FOR TROUBLE HUNTERS

You need not waste time baring the wire.

Constructed to test any size line.



THE TEETH grip the line or binding post.

THE PIN pierces the insulation and makes a perfect test connection.

Sample Dozen	-	12½ Cents Each
100 Lots	- -	11 " "
500 "	- -	10 " "
1000 "	- -	9 " "

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We have on hand newly manufactured, guaranteed apparatus of all makes

Telephones, Switchboards and Supplies

which we can sell to you at a reduction of 40% to 50% in price. Write us to-day.

We rebuild all kinds of telephone apparatus. Make it as good as new. Consult our repair department.

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Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS and AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy

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London Branch—Audrey House, Ely Place, Holborn.
Paris, France—E. H. Cadiot, 12 Rue St. Georges.
Berlin—European Weston Electrical Inst. Co., Ritterstrasse No. 88.
New York Office—74 Cortlandt Street.

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VOLTMETERS, AMMETERS, MILLIVOLTMETERS, VOLTAMMETERS, MILAMMETERS, OHMMETERS, PORTABLE GALVANOMETERS, GROUND DETECTORS AND CIRCUIT TESTERS.

Weston Standard Portable Direct Reading Voltmeter. Model 1.

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DESIGNED with a full understanding of the conditions of telephone service and built electrically and mechanically to meet these demands.

Gould Storage Battery Co.

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By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

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Steel Telephone Signs
All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.
Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY
DEFIANCE, OHIO

WILLIAMS TEST CLAMPS

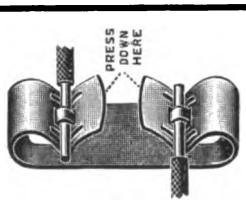
Will pay you a fine profit in the saving of labor and material. They save skinning—they save re-taping—they save time—they save the wire. Send 75 cents for a pair (two), postpaid, on 30 days' trial. Your money back if you want it.

The Williams Test Clamp Co.
720 Electric Bldg. Cleveland, O.

STAR EXPANSION BOLT CO.

CATERERS TO THE TELEPHONE TRADE

Designed especially for quick work in stone
142 Lake Street Chicago — Bayonne, N. J. — 147 Cedar Street New York



FAHNESTOCK TEST OPENER

For Connecting
Iron Wire
Copper Wire
Iron to Copper Wire

Send for Sample

FAHNESTOCK ELECTRIC CO.
129 Patchen Ave., Brooklyn, N. Y.

Insulated Staples

4 Sizes

Pat. Nov. 1900

BLAKE

TUBE FLUX for SOLDERING

Full Size of Tube, 1" x 5"

Patented Feb. 4, '08

COMPRESSED CLEATS — FOR USE ON PLASTERING

Exact Size — Pat. July, 1906

BLAKE SIGNAL & MFG. CO. — WRITE FOR SAMPLES — **246 SUMMER ST., BOSTON, MASS.**

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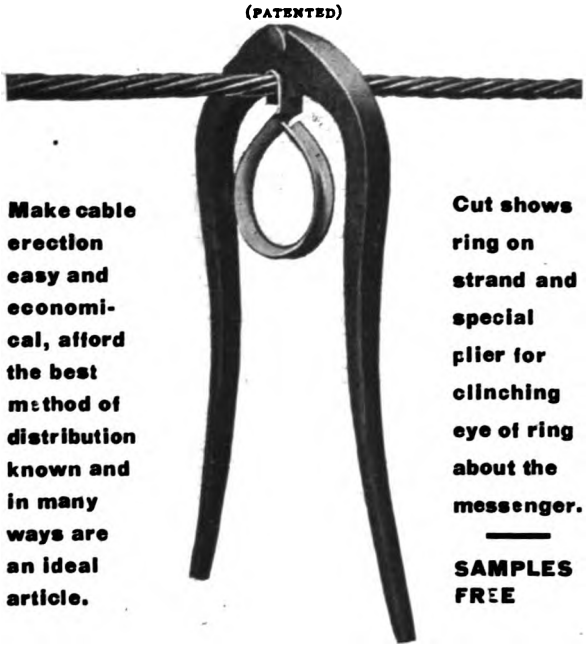
LOCKE
AERIAL
RINGS
(PATENTED)



Make cable erection easy and economical, afford the best method of distribution known and in many ways are an ideal article.

Cut shows ring on strand and special plier for clinching eye of ring about the messenger.

SAMPLES FREE

CAMERON APPLIANCE CO., EVERETT, MASS.

BELDEN MAGNET WIRE

We carry the largest stock of the fine sizes in the West. Silk insulation our specialty

We appreciate your small orders and give them prompt attention. Prices reasonable

Our No. 3 Catalog sent on request

BELDEN MANUFACTURING COMPANY
194 Michigan Street 46 Chicago

STAR CABLE DOG
For the hanging of all sorts of UNDERGROUND or OVERHEAD CABLES. Used in both the New York and Boston
SUBWAY WORK
Samples and Prices Upon Request
STAR EXPANSION BOLT CO.
Bayonne, N. J.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN.
GERMAN SILVER
RESISTANCE SHEET AND WIRE
COPPER WIRE
BRASS, BRONZE AND COPPER

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THE well equipped copy department of the McGraw Publishing Co. is at your service to get up attractive advertising suggestions each week, so that by changing copy frequently you can obtain the maximum benefit from your advertising space. No charge is made for this service excepting where finished drawings or engravings are required, and these are charged only at cost price.

American Telephone Journal

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TELEPHONE
CABLES

TELEPHONE
WIRE

WIRE ROPE
WIRE STRAND

JOHN A. ROEBLING'S SONS CO.
TRENTON, N. J.

TRADE MARK

IRONITE

Registered U. S. Patent Office

When the "dog days" come and the heat makes copper drop wires sag and stretch—causing much woe and expense—stop the trouble by replacing all your copper drops with IRONITE.

It always costs less than copper and is twice as strong.

Get a sample.

Durant Electric Supplies Co.
52 Fifth Avenue CHICAGO, ILL.

STROMBERG-CARLSON

Standard Capacities

Sizes: 1 to 450 Pairs

S. W. P. Insulation

D. W. P. Insulation

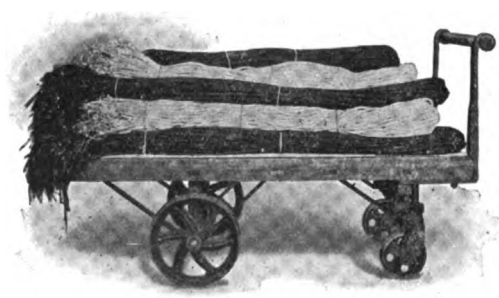
TELEPHONE MFG. CO.

CHICAGO, ILL. ROCHESTER, N. Y.

STROMBERG-CARLSON TELEPHONE MFG. CO. Central Energy

STROMBERG-CARLSON QUALITY SWITCHBOARD CORDS

WEAR WELL—
BETTER THAN OTHERS



100 DIFFERENT TYPES

WE HAVE WHAT YOU WANT

SEND US A SAMPLE ORDER TO-DAY

STROMBERG-CARLSON TELEPHONE MFG. CO.

ROCHESTER, N. Y. CHICAGO, ILL.

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AS I SEE IT

¶ *I would suggest it should be read by those who never advertise, except when business is good. It has a good moral:*

¶ Once upon a time a donkey fell into a deep hole, and after nearly starving caught sight of a passing fox, and implored the stranger to help him out.

¶ "I am too small to aid you," said the fox, "but I will give you some advice. Only a few rods away is a big, strong elephant. Call to him and he will get you out in a jiffy."

¶ After the fox had gone the donkey thus reasoned: "I am very weak from want of nourishment Every move I make is just so much additional loss of strength If I raise my voice to call the elephant I shall be weaker yet. No, I will not waste my substance that way. It is the duty of the elephant to come without calling."

¶ So the donkey settled himself back, and eventually starved to death.

¶ Long afterwards, the fox on passing the hole saw within a whitened skeleton, and remarked:

¶ "If it be that the souls of animals are transmigrated into men, that donkey will become one of those merchants who can never afford to advertise."

(Lewis—Phila.)

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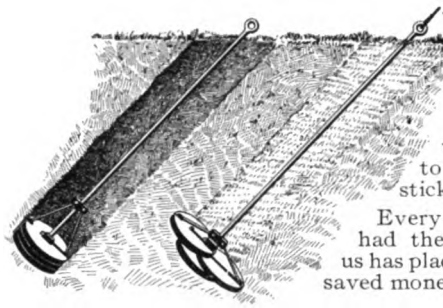
IT COSTS 2 CENTS



to start a Guy Anchor Argument with us.

Perhaps you will not agree with all we have to say about Ever-stick Anchors.

Every man who has had the argument with us has placed an order and saved money.

SPECIALTY SALES COMPANY
Cedar Rapids, Ia.

The Bluffton Anchor

Expands in solid earth to a perfect circle. It is the most efficient anchor for use where it is necessary to remove earth.

The dead man is its only successful rival.

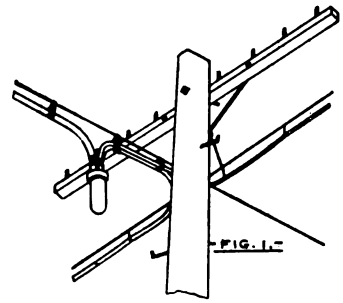
Write for details of our 30-day trial proposition.

BLUFFTON ANCHOR CO., Bluffton, Ohio

Matthews' Cable Splicing Joints

(Formerly called Hargis Cable Joints)

Patented Oct. 17, 1905



Patent Number 802,337

Fig. 1 shows method of joining together a main aerial cable of 150 pairs and two branch cables, one of 100 pairs and one of 50 pairs. This drawing was made from a photograph furnished us by R. Cline, Supt. of Construction of the Central Union Telephone Company at Indianapolis.

YOU SHOULD USE

Matthews' Cable Splicing Joints if you have lead covered cables to splice; if you want to have a feeling of complete mastery over your cables whether they are overhead or underground; if you want a flexible cable distribution; if you ever have to get at the pairs for test or change of multiples; if you want to save money, not only on the first cost of splices, but also on the maintenance costs of your cables. *Write for descriptive booklet.*

W. N. MATTHEWS & BRO.

Manufacturers of Patented Money-Saving Specialties.

214 North Second Street, St. Louis

Always Ready! Always Works!

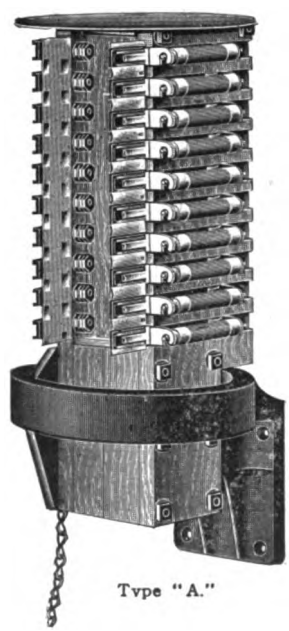
A Sky Rocket Arrester

48 inches of wire exposed to the grounded tube with only thin air space separating. List price $1.00 for any iron circuit. Write for discounts and circulars.

CHANCE MANUFACTURING CO.
CENTRALIA, MO., U. S. A.

EXTRA GOOD

WRITE FOR NEW PRICE LIST JUST OUT.



Type "A."

SEND FOR COMPLETE CATALOGUE

MANY STYLES

NO WIPED JOINTS

INTERIOR POTHEAD

This style can be furnished in **PORCELAIN** with or without protection. All sizes.

American Electric Fuse Co.

Muskegon, Mich. **New York, N. Y.**

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Cables which, after laying, are to be tapped are more accessible when installed with

Orangeburg Fibre Conduit

For example: Main-line conduits, laid in newly opened streets in anticipation of service connections later on.

If the conduit so laid be of iron, to tap it, the tubing must be cut by a diamond-pointed tool, opened up by a spreading machine and cut away, entailing a tedious amount of work. Cables in such cases are frequently damaged.

With Orangeburg Fibre Conduit the concrete about the conduit is removed and with very simple tools an entrance effected to the cables, easily, quickly and without damage.

No rough, jagged edges left to scratch or tear the cable.

The Conduit Book, setting forth the peculiar advantages of Orangeburg Fibre Conduit, will be sent to any address on request.

The Fibre Conduit Company
Main Office and Works: Orangeburg, N. Y.

Chicago Office: 1760 Monadnock Building
Pierson, Roeding & Co.: San Francisco, Cal. / Los Angeles, Cal. / Seattle, Wash.
McClary-Jemison Co.: Birmingham Ala.

CROSS ARMS

LONG LEAF YELLOW PINE

All Heart, Special Sizes, Plain Painted or Creosoted. Large Stocks, Quick Shipments.

LEWIS LUMBER & MFG. CO.
Hattiesburg, Miss.

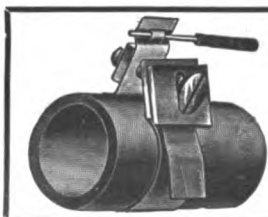
WHITE CEDAR POLES
Prompt Shipment Best Grade
Standard Cedar & Lumber Co.
34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

WHITE CEDAR POLES
LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—
YARDS: MENOMINEE, MICH. ESCANABA, SUPERIOR, WIS. DEER RIVER, MINN.
FRANCIS BEIDLER & CO.
CHICAGO, ILL.

POLES
Northern White Cedar
Give best service. Our prices are lowest.
May we quote?
ITASCA CEDAR COMPANY, Deer River, Minn.

The BLACKBURN GROUND CLAMP

PATENTED
IS THE BEST AND CHEAPEST CLAMP MADE
You may question this statement. If you will let us send you a sample and our prices, you may compare them with others and judge for yourself.
BLACKBURN SPECIALTY CO.
412 Frankfort Ave. N. W. Cleveland, O.


M. & B. Ground Clamp
Patent applied for.
For connecting telephone ground wires to lead or iron pipes. Simple in construction; easy to adjust; fits any size pipe. Remains tight whether pipe expands or contracts. No loose connections when our clamp is used. Write us for samples and prices. Milwaukee Electrical Specialties Co., Box 393, Milwaukee, Wis.

POLES AND PILING Chestnut, Red Cedar and Cypress
Lengths 16 to 65 feet
J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.
PORTER CEDAR CO., Saginaw, Michigan

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National Pole Company

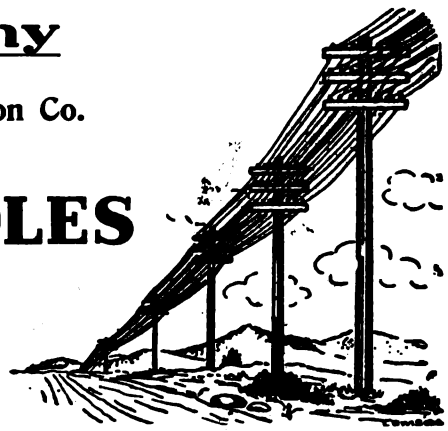
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from
Maine to Washington



The Valentine-Clark Co.

ERNEST L. CLARK, President

Michigan
Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.
Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE
234 La Salle Street — Chicago, Ills.

Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.
Tribune Building, Chicago

LARGE LOTS of LONG POLES

Well Seasoned White Cedar
Immediate Shipment
J. W. Morrison Lumber Co.
General Office: 919 Lumber Exchange, Minneapolis

QUALITY, NOTHING BUT QUALITY, accurately describes
BISSELL ARMS AND PINS

Arms made from *real* long leaf yellow pine and Washington fir, and Pins from *real* black locust. All priced as low as the ordinary kind.
Special Sizes a Special Delight.
Get Leaflet Number Three.
THE F. BISSELL COMPANY, Toledo, O.

POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY
FARIS & MAYHEW LUMBER & POLE CO.
202 & 203 Continental Building, Denver, Colo.

POLES Red Cedar and White Cedar

Western Sales Agent—"C. A WOOD PRESERVER"
WILL F. BRUER, 18 Walnut St., Kansas City, Mo.

IDAHO AND MICHIGAN
CEDAR POLES

Large Stocks (10 Yards) Low Prices
Idaho Red Cedar Poles Our Specialty
Western Lumber & Pole Co.
SUITE 416 CHARLES BUILDING · · DENVER, COLO.

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 28 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Boyne Falls. W. C. Sterling & Son Co., Monroe, Mich.

WHITE CEDAR POLES

Buy from the Producers
and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

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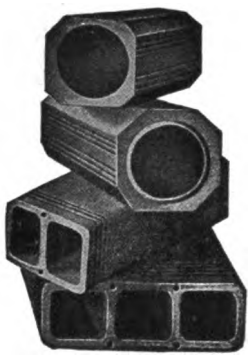
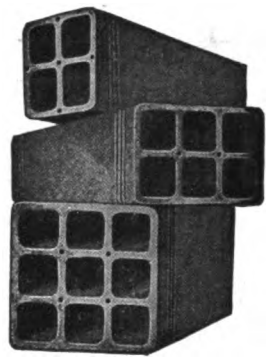


VITRIFIED

CLAY CONDUIT



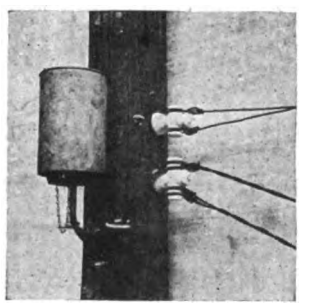
SINGLE and MULTIPLE DUCT

IMMEDIATE DELIVERY ON ALL STANDARD SIZES

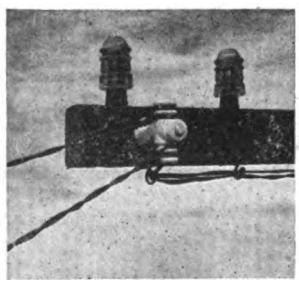
Factories: New Jersey, Pennsylvania, Ohio

Standard Vitrified Conduit Company

Main Offices: 39-41 CORTLANDT ST., NEW YORK, N. Y.



SUGGESTION No. 13



SUGGESTION No. 4

SUGGESTION No. 5

SUGGESTION No. 8

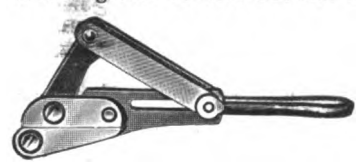
Somo "UNIVERSAL INSULATOR" Suggestions

They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
Grooves for any direction—Universal,
All porcelain—No rot or rust and very neat.
Cheap to erect; cheaper to maintain.
WRITE FOR DESCRIPTIVE LITERATURE

UNIVERSAL SPECIALTY CO., 118 S. Seventh St., Terre Haute, Ind.

KLEIN'S NEW "CHICAGO GRIP"

is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.

STAR EXPANSION BOLT COMPANY
CATERERS TO THE TELEPHONE TRADE

For quick, effective work in brick

142 Lake Street Chicago — Bayonne, N. J. — 147 Cedar Street New York

THE AMERICAN TELEPHONE JOURNAL HAS A LARGER CIRCULATION THAN ANY OTHER PAPER IN THE FIELD

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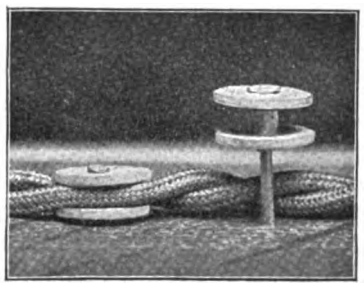
EUREKA FIBRE INSULATORS

A NEW STYLE

The value is in the method that they are attached without injury to the wire.



Made in Three Types
50, 60, 70
$\frac{3}{4}$" $\frac{7}{8}$" and 1" long, respectively.

PRICES AND SAMPLES ON APPLICATION

COMMERCIAL ELECTRICAL SUPPLY CO.

Fifteenth and Pine Sts. ST. LOUIS, MO.

"REBUILT"

TELEPHONE EQUIPMENT

Is "REBUILT," not "REPAIRED"

One's like "New," the other's "Old"---always will be

Our "Rebuilt" Equipment Department "Rebuilds" Switchboards—Telephones—Apparatus—Additional Switchboard Equipment—and Handles Wire—Cable—Cords—Everything Telephonic.

GUARANTEED SAVING 30 TO 50 PER CENT.

Get Quotations, and if you want our "Rebuilt" Bargain Bulletin sent you regularly—say so—it's FREE. *Address*

"REBUILT" EQUIPMENT DEPARTMENT
PREMIER ELECTRIC CO.
56 W. VAN BUREN STREET, CHICAGO, ILL.

Remember "Rebuilt"—that's OUR word

WE MAKE TOLL TICKETS BY THE MILLION

By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
Toll Journals	Trouble Tickets
Toll Ledgers	Rental and Toll Bills
Monthly Check Reports	Voucher Checks
Cash Books	Card Index Systems

Steel Telephone Signs

All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

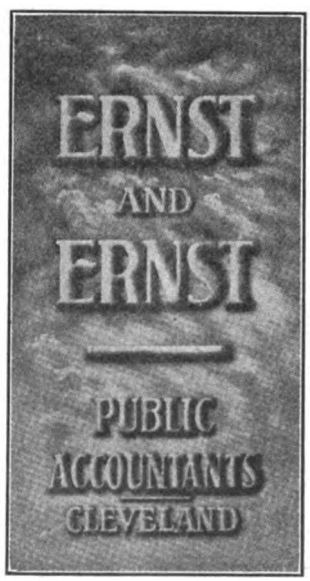
Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY
DEFIANCE, OHIO

SOME OF OUR CLIENTS

The United States Telephone Company, Cleveland
The New Long Distance Telephone Company, Indianapolis
The Cuyahoga Telephone Company, Cleveland
The Toledo Home Telephone Company, Toledo

Our Systems Reduce Expense and Give You Accurate Results



Complete Typewritten Financial Statement Furnished With Each Audit Report

The Indianapolis Telephone Company, Indianapolis, Ind.
The Citizens Telephone Company, Columbus, Ind.
The Citizens Telephone Company, Delaware, Ohio
The Belmont Telephone Company, Bellaire, Ohio

Correspondence Solicited

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The 3d Week in June

¶ Is the telephone business dull?

¶ Seven large exchanges were ordered during the third week in June. The Dean Electric Company is building six of these jobs for the following cities:

Oskaloosa, Ia. Ennis, Texas
Stamford, Texas Wahoo, Nebr.
Saginaw, (East) Saginaw, (West) Mich.

¶ A $100,000.00 week.

¶ And the business was secured after sharp competition with the manufacturers of both the mechanical and manual types of apparatus.

¶ In the estimation of six out of seven purchasers, Dean apparatus is superior to any other make on the market. Is this not a real reason for giving us an opportunity to show our goods to you?

ADDRESS—THE DEAN ELECTRIC CO.,
Kansas City. ELYRIA, O. San Francisco

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COMBINATION SWITCHING TELEPHONE

FOR CONNECTING FIVE FARMERS' LINES

¶ If you have ever attempted to do any switching on a farmers' line by means of knife switches you realize how much trouble it is and the time it takes. Here is a telephone switchboard that has proven to be a much more rapid, practical and positive device and is intended for systems that will never require more than five (5) farmers' lines.

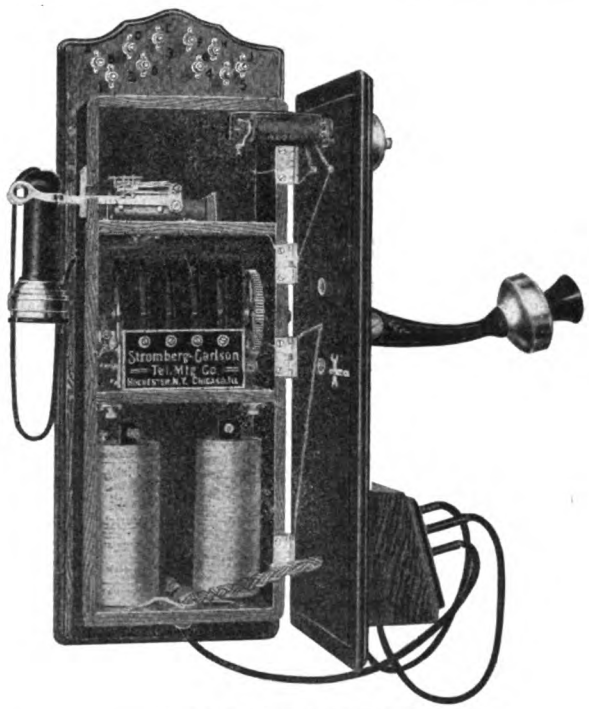
THE OPERATION OF THE SWITCHING DEVICE

¶ **To Call a Party**—Insert the **calling plug** in the jack corresponding to that line and then give the proper number of rings.

¶ **To Answer a Call**—Insert the **answering plug** in the jack of that line from which the call came.

¶ **To Connect Two Lines**—When a party calls ascertain whom they want on any of the other lines; call the party wanted; then connect the two lines with the **connecting plug.** To listen in when two parties are connected, insert the **answering plug** in the **home** or **listening jack.**

QUALITY APPARATUS



APPARATUS EXCELS

CODE NO. 573 TELEPHONE

A COMPLETE SWITCHING DEVICE

¶ The ringer on the **Combination Switching Telephone** is connected to line **No. 3**—binding posts *E* and *F*. It is necessary to provide a **No. 300**—1600-ohm **Extension Bell** for Lines Nos. 1, 2, 4 and 5. The regular bridging extension bells should be wound to the same resistance as the telephones on the line with which they are used.

IT COSTS LITTLE MORE THAN A TELEPHONE
WRITE FOR PRICES AND BOOKLET NO. 109

STROMBERG-CARLSON TEL. MFG. CO.
ROCHESTER, N.Y.-CHICAGO, ILL.

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"An Ounce of Service

is worth a ton of sentiment." That's a pretty good motto. It occupied a prominent place on the walls of the Illinois Association's Convention Hall in Champaign the last week in May. It was the keynote of the Convention; it is becoming the keynote of the Independent movement.

That Ounce of Service—

Are you giving it to your subscribers, or are you giving them a fraction of it and the rest in sentiment? The people who have had their ton of sentiment in connection with the Independent movement are now clamoring for their ounce of service.

You can give it

to them, in quantity, perhaps, with your present manual equipment, but you can't give it in quality without automatic equipment. The Independent-Bell struggle is going to result eventually in the "survival of the fittest." Get automatic equipment and be among the fittest.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Benton, Minn.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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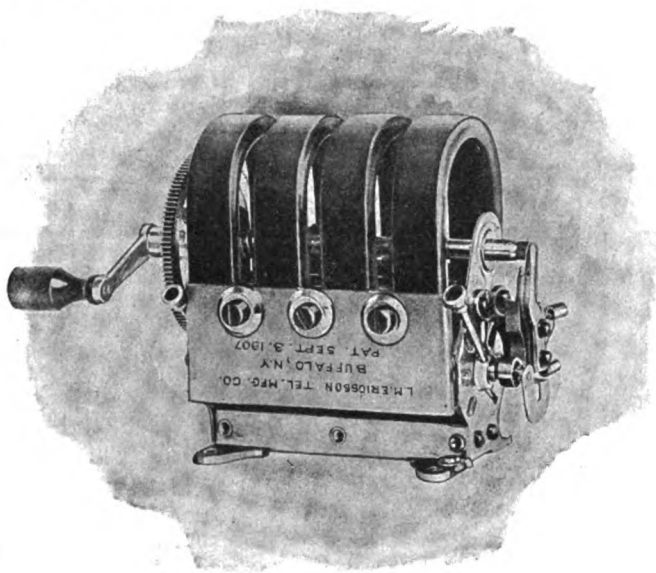
TRADE MARK

MR. EXCHANGE MANAGER

Have you ever made comparative tests to ascertain which make of generator *actually gives the greater output?*

Take an Ericsson four-bar, the smallest generator on the market, and compare its output with any other.

Don't take our word for its positive supremacy—convince yourself. You surely want to know "what's best"—compare things and derive your own conclusion.



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One Button

for each line—that's all the mechanism there is in

The Corwin System of Automatic Intercommunicating Telephones

Jacks, plugs and cords are eliminated—breakage of cords, short circuits and poor connections are done away with. The combined ringing and talking key withstands wear and the entire system is most reliable in action. Don't you want details?

Corwin Telephone Mfg. Co.

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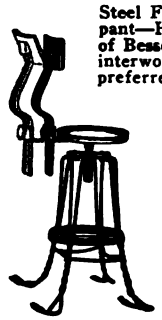

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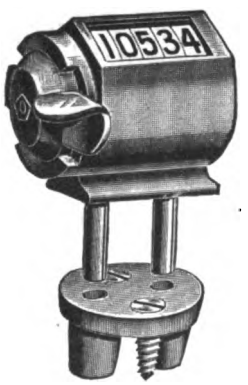

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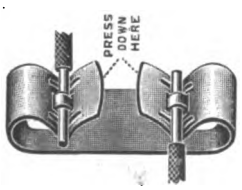

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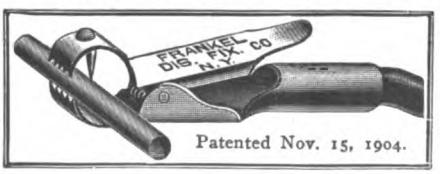

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Sample Doz. - 12½ Cts. Each
100 Lots - - 11 " "
500 " - - 10 " "
1000 " - - 9 " "

From your supply house or

FRANKEL DISPLAY FIXTURE COMPANY

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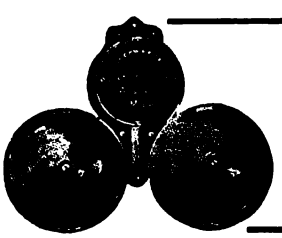
TELEPHONE EAR CUSHION Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the ear-drum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash! crash! noises. Made by

HURON RUBBER COMPANY, CLEVELAND, O.



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is *all* that is necessary to impart the character of this telephone—the arrangement of apparatus and wiring, which is *unique* and distinctive of **Cracraft Leich apparatus.**

Such *extraordinary* individuality is not based upon *one*, but a *number* of qualities.

Sound engineering thought and care have been spent upon *each individual part* of the apparatus composing the whole, making each part a unit of *high character* and the complete telephone a *standard* of excellence.

Only materials which experience has proven *best* for the particular work required are used. The tools and appliances employed in its construction are of the *latest design* in the art of modern manufacture. This insures a *uniform* and *well assembled* product and makes it possible to put this telephone upon the market at a *satisfactory price.*

SEND FOR FURTHER PARTICULARS AND PRICES

Cracraft Leich Electric Co.

GENOA, ILLINOIS

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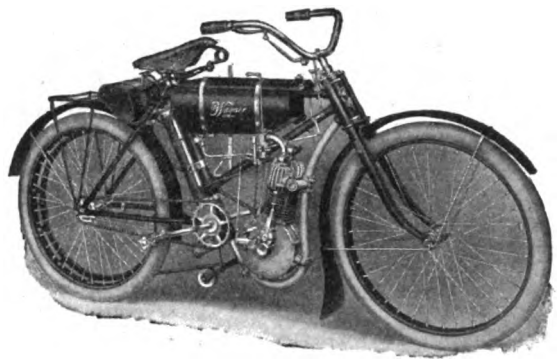

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SIMPLE PRACTICAL ECONOMICAL

The quick transportation for

Lineman, Inspector, Collector, "Trouble-shooter"

Descriptive catalog and particulars of our special proposition to the Telephone Trade upon application.

Wagner Motorcycle Company

St. Paul, Minn.

WHAT THE

"Duplex" Bridging Telephone

WILL DO

By turning the crank backward it will signal the switchboard secretly and without any instrument on the line receiving the "single tap."

By turning the crank forward, all bells on the line will ring but the switchboard drop will not respond.

No push-buttons or relays are required.

Operates on grounded as well as on metallic lines.

Will operate on lines now installed and in conjunction with every other make of instrument.

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Makers of "Better Telephones"

South Bend **Indiana**

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BAIRD PARTY-LINE SECRET-SERVICE TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

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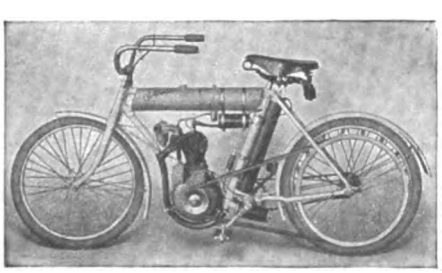
BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.

ARMAC MOTOR CYCLE



Mr. HELLO MAN—

Every day you are losing money when you don't use an ARMAC MOTOR CYCLE for trouble men.

WRITE US TO-DAY FOR THE FIGURES.

H. H. THORP & CO.
SALES AGENTS

ARMAC MOTOR CO.

1221 Michigan Ave. **CHICAGO, ILL.**

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"ROBERTS" AND WHAT IT MEANS

5 The Roberts System offers the following strong advantages: Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, Etc., and adaptability to any existing local battery exchange. Weekly advertisements take up the various features in detail. Full information in Bulletins.

Call Signal

Suppose a party signals in. If the operator does not respond promptly by tapping his bell, it shows that the line is busy. If the subscriber wants to be called as soon as the line is available he simply leaves the receiver off the hook. This act alone does not close the circuit of the local cells, which is controlled by the lock-out ringer. The instant the line is free, a tap of his bell or a continued ring recalls him to the phone and places him in talking connection. If he doesn't respond, the operator locks him out again before restoring the line to normal, or serving other subscribers on that line. In case there are two or more signals set, the operator answers them one at a time in regular sequence, in all cases working over the entire line progressively, thus rendering it impossible for one party to secure a second connection before all other parties on that line have had a chance to talk. A single "move" picks up the signals. The same "move" automatically restores the line to its normal condition if no signals are encountered.

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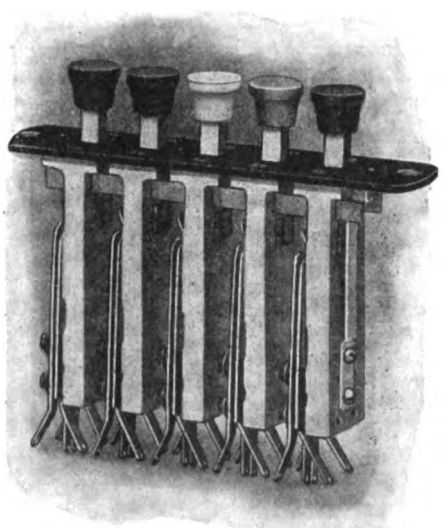
HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago

The Monarch Four-Party Master Key



This key—designed for our direct current four-party system—is so constructed that the pressing of any button releases any of the others. It is therefore impossible to have both direct and alternating currents on the line at the same time.

The contact springs are long and the strain of operation is distributed throughout their entire length. Hard rubber rollers act as bearing points against these springs and further reduce the wear.

Each group of contact springs is mounted on a separate frame and can be removed easily without disturbing the other groups or even interfering with their operation.

If interested in four-party systems don't fail to investigate our DIRECT CURRENT system. It has features which surely will attract you.

Let us send you a catalogue.

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Factory and General Office
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Branch House
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TELEPHONE INSPECTORS!

Do you wish to increase your income? We have something of interest to you. Write for our proposition.

MOUNTAIN STATE ELECTRICAL CO., Wheeling, W. Va.

U. S. COMBINED

CASH REGISTER and PAY STATION

GIVE THE BEST SERVICE

Single Gong only — A Cash Ticket with every collection

NO ERRORS — CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.

WITH **GRAY PAY STATIONS**

NO LEVERS
NO SPRINGS
NO TROUBLE

YOU SIMPLY DROP THE COIN

GRAY TELEPHONE PAY STATION CO.

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WILLIAMS TEST CLAMPS

Will pay you a fine profit in the saving of labor and material. They save skinning—they save re-taping—they save time—they save the wire. Send 75 cents for a pair (two), postpaid, on 30 days' trial. Your money back if you want it.

The Williams Test Clamp Co.

720 Electric Bldg. — Cleveland, O.

We have on hand newly manufactured, guaranteed apparatus of all makes

Telephones, Switchboards and Supplies

which we can sell to you at a reduction of 40% to 50% in price. Write us to-day.

We rebuild all kinds of telephone apparatus. Make it as good as new. Consult our repair department.

Missouri Valley Telephone & Electrical Construction Co.

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Insulated Staples

4 Sizes

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BLAKE

TUBE FLUX for SOLDERING

Full Size of Tube, 1" x 5"

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WRITE FOR SAMPLES

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Exact Size — Pat. July, 1906

246 SUMMER ST., BOSTON, MASS.

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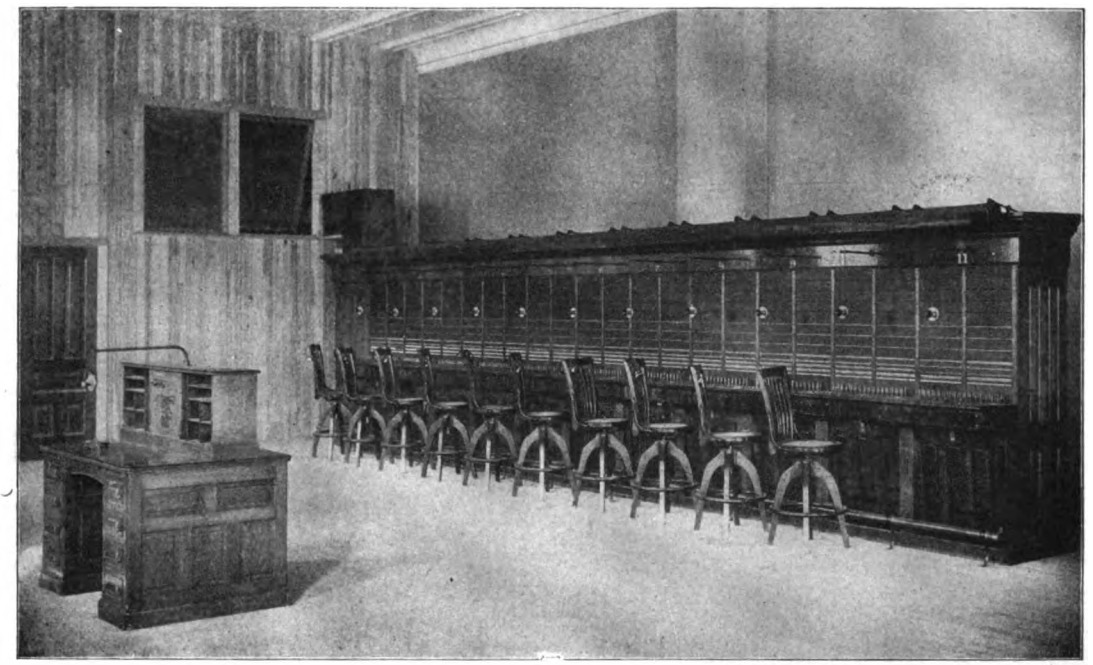

11-POSITION COMMON BATTERY MULTIPLE BOARD

WE ARE IN POSITION TO MAKE ANY SIZE EQUIPMENT OR ANY TYPE OF BOARD YOU REQUIRE—WRITE US.

STERLING ELECTRIC COMPANY

GOOD GOODS LA FAYETTE, IND.

TO HAVE immediate attention of the operator is one feature of telephone service which impresses the user most favorably. To wait or vainly strive for attention, however briefly, is aggravating.

With the Clement Automanual System there is no waiting—no delay. The calls are distributed uniformly and always to the operator who is not engaged. The operators have no duties but to inquire the number wanted and to set their keyboards accordingly—the work of a moment. This done they are ready to devote their attention entirely to the next call. There can be no accumulation of calls in any position, and the calls must be answered in the order received.

This feature, combined with immediate and automatic disconnect, makes the most rapid and satisfactory service produced.

Trade Mark
AUTOMANUAL
Reg. U. S. Patent Office

The North Electric Company

DALLAS CLEVELAND KANSAS CITY

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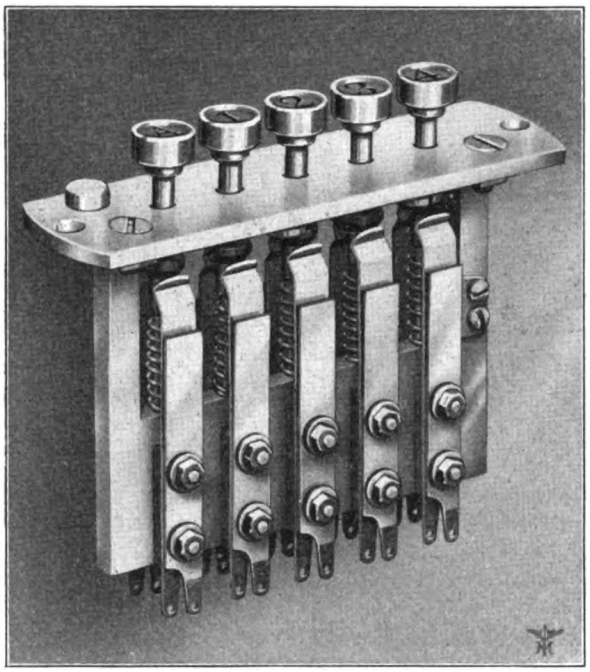

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SIMPLE, POSITIVE, EFFICIENT, NON HARMONIC, NON STEP BY STEP, NON SYNCHRONOUS, NON LOCK OUT, NON EXPENSIVE

to buy or maintain

NOMINAL advance in cost above non selective instruments.
NO advance in cost of operation.
NO extra battery power.
NO extra switchboard equipment beyond the usual type of a selective key. See cut.
NO push buttons.
NO complicated apparatus whatever.
NO ground connections.
NO cross or false signalling as with other selective systems.
OPERATOR calls subscriber wanted without ringing any other telephones on same line.
SUBSCRIBER calls central without ringing any other bells on same line.
INSPECTOR has no trouble with this system.
MANAGER Pleases his subscribers by giving perfect service.
Pleases his stockholders on account of the economical features.
STOCKHOLDER Gets larger dividends on account of getting the same rental on a non complicated, non expensive-to-buy-and-maintain apparatus as he would on a complicated, expensive-to-buy-and-maintain apparatus.
MANUFACTURER We get your future orders on account of the splendid service rendered at the lowest possible cost and without any trouble.
ADD up the above line of talk and see if the answer is not what you have been looking for, for a long time.

Our apparatus and prices are right.

(A Swedish-American Telephone will transform your worst kicking subscriber into a booster for your service. Pick him out, send us his name, and if we don't convert him for you the telephone won't cost you a cent.)

Swedish-American Telephone Co.

Kansas City, Mo. **Chicago, Ill.**

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

VOL. XVIII. NEW YORK, SATURDAY, JULY 11, 1908. No. 2.

PUBLISHED WEEKLY BY THE

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NEW YORK, SATURDAY, JULY 11, 1908.

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A Check on Competition

The new Public Service Commissions have been regarded from two points of view. In one aspect, they have been treated and spoken of as the representatives of the public as against the corporations. Seen from another angle, it has been urged that they could and would serve as a bulwark for existing corporations, and would thus act as a check on competition. With regard to the Public Service Commissions of New York State certain facts have already emerged to prominence. The courts have held that it would be unconstitutional for the commissions to consider only appeals and complaints from customers; they must also entertain requests from companies as to desired changes in rates and service. The commission dealing specifically with the corporations of Greater New York has now gone one long step further and has denied to a newcomer in the electric lighting field on Manhattan Island the power to issue new securities that alone would enable it to secure the money for doing real business. The bearing of this on possible proposed telephone competition it is easy to see. If the telephone companies were all to be placed under commission control, the effects of a general application of rules or rulings in check of competition would obviously be quite serious.

It is to be borne in mind that the case in New York City is a special one. The new company has a franchise of doubtful validity and requested the privilege of issuing many millions of stocks and bonds—"much too large." These seem good grounds for a refusal, but the commission is extremely frank in stating that they are not the only grounds. The decision says: "Competition would cause inconvenience and expense to the public, would cause duplication of plant, and ultimately be used as a reason why rates should not be reduced to consumers." Moreover, it is further held that "practically all the advantages claimed by the applicant as the probable results of competition can be secured through the powers of the commission." It is broadly hinted that the competing company would sooner or later in some way come to terms with its rival.

Here, it will be seen, the commission gets upon the controversial territory occupied by competing telephone systems, and, in advance, ennunciates principles that bear directly against competition. Whether such is the exact aim and idea of the two commissions that divide the State between them is not avowed or to be inferred, but the language we have quoted is tolerably plain and direct, and certainly gives food for thought. The "consumer" has one comfort, meantime, namely, the insistence of the commission on the point that whatever company is given the "monopoly" must hold it by good service, which in the case of electric lighting it considers now to be given. This precise thought is put very sharply when it is said: "That competition cannot be depended upon to protect the consumer from high prices and poor service has been fully demonstrated"—the natural inference being that commissions

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are the one thing needful. To say the least, it would be interesting to hear John Stuart Mill, for example, discuss from the doctrinaire standpoint of the elder economists the theory that all virtue has gone out of competition.

The Legality of Consolidation in Indiana

Mr. Clawson's able paper on "Legal Impediments to Consolidation," concluded in this number of AMERICAN TELEPHONE JOURNAL, is worthy a careful perusal by everyone financially interested in the telephone business—whether Independent or Bell. Most of us have heretofore approached the question of consolidation from a commercial and sentimental point of view. There has been altogether too little attention paid to its legal aspect.

The division of his paper, which Mr. Clawson presents under the head "Involuntary Consolidation," since it deals with matters not covered by the laws of Indiana, is not particularly germane to the issue raised for that state.

From his discussion under the heading "Voluntary Consolidation," are gathered the following condensed statements of particular interest:

Public service corporations chartered by the State cannot consolidate unless it is expressly stated in their charters that they shall have such right; no such right is granted in the charters of telephone companies and the consummation of any attempt at consolidation would render the charter void.

The Indiana statutes permit a telephone company organized under the laws of that State "to have power to lease or attach to other telephone lines or exchanges by lease or purchase"; but the power to lease or purchase is not the power to consolidate, as the leased or purchased company still maintains its corporate existence, while a consolidation of two companies wipes out the consolidating companies as corporate entities. They no longer exist, and can neither sue nor be sued at law.

Granting that it were possible to find some law of court decision which seemed to give a reasonable pretext to consolidate, it must be remembered—as Mr. Clawson very forcibly points out—that "in construing statutes giving power to public utility corporations, the interests of the public are the determining facts, and if there is any doubt, that doubt is resolved against the corporation and in favor of the public."

While the foregoing applies to domestic corporations, or corporations holding their charter from the State of Indiana, the law is no less explicit and plain where one corporation is a foreign creature or has its charter from another State. Should one be a domestic and the other a foreign corporation, it is illegal for such telephone companies to consolidate, unless the statutes of each State, by explicit enactment in granting charter rights, permit the telephone company so chartered to consolidate with a company organized in another State.

In other words, Mr. Clawson's reasoning leads to the conclusion that if the charter of a telephone company, granted by a neighboring State, does not expressly grant it the right to consolidate with telephone companies organized in other States, and if a telephone company organized under the laws of Indiana is not by legislative enactment granted the right in its charter to consolidate with telephone companies organized in other States, then the foreign telephone and a competing company organized in Indiana have no right, in law, to form a consolidation, and, should they attempt such a consolidation, it would be illegal and the parties attempting to form it would be amenable to the law as the statutes may provide for such cases.

Whatever may be the wishes of any community, from an ethical or commercial standpoint, for consolidation, the entire trend of Mr. Clawson's paper is that, from a legal standpoint, consolidation of competing telephone companies in the State of Indiana is absolutely unlawful.

Preparedness for Emergencies

When a big trouble comes in a telephone exchange, things have to be done on the jump. Not always is there time to both plan and act. A case in point recently came under our observation. It occurred in a small telephone plant, operated on the common battery system. There was the usual single set of cells, a mercury arc rectifier for charging it, and one electric light company to furnish the current. In the electric light plant shut-downs of short duration were not unknown, but had not been serious enough to inconvenience anybody. Finally, shortly after the telephone company had engaged a new superintendent, there was another interruption of primary current. When this break-down came the young superintendent took the trouble to visit the electric light plant and learn for himself the nature and extent of the damage. He found this time that it was serious, and meant a week's shunt-down.

The telephone battery had been freshly charged, so that there was no immediate danger, but its capacity was, naturally, not sufficient to provide current for the week. It was necessary to cut in a new source of power. In half a day's time the telephone man had run a pair of heavy wires from the central office to a wholesale house four blocks away, where there was a storage battery of 60 cells, and when his own battery was only partially run down he was ready to recharge it. When asked what he proposed to do if the borrowed battery gave out before the electric light plant was ready, he outlined the following: At the power house was an exciter, giving about 110 volts; at Blank & Company's was a gasolene engine. The engine was heavy, the exciter light. He would load the exciter on a dray, install it with the engine, and run it. The current could be carried to the office over a pair of telephone wires, already in place, which he had located and found suitable.

This ability of the superintendent to deal with the situation so promptly and thoroughly was not the result of chance. When he had first taken charge of the plant the lack of reserve power had immediately attracted his attention. He had reasoned that if there was only a single unit in each main division of the power system, the failure of any one of these divisions might mean suspension of telephone service. So he had looked up all the available resources, which in the emergency which actually presented itself enabled him to keep the plant running.

Failure of power does not occur in every exchange, but there are few offices not subject to unexpected accidents of one type or another. It pays to be prepared in advance for the accidents which come sooner or later to every business. It is well to look ahead, and map out a plan which will be ready when the time comes for action. People have little respect for the man who is caught unawares by sudden accidents or troubles, but they have unbounded admiration for the one who has a successful remedy for the case, and is prompt in applying it. To do this is not easy, but nothing worth while is easy. It means thinking about the telephone business out of hours, reading the technical papers, absorbing information from every source; in short, it means living with the business.

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Wireless Telephony*

By R. A. Fessenden.

For wireless telephony three things are necessary:

1. Means for radiating a stream of electrical waves sufficiently continuous to transmit the upper harmonics on which the quality of the talking depends.

2. Means for modulating this stream of waves in accordance with the sound waves.

3. A continuously responsive receiver giving indications proportional to the energy received, and capable of responding with sufficient rapidity to the speech harmonics.

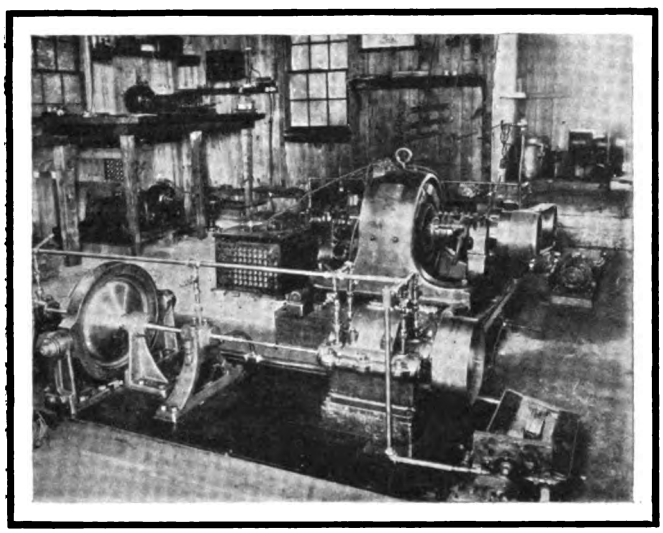

Fig. 1—Type of High Frequency Alternator Used in Wireless Telephony.

Work on the wireless telephone was commenced before a satisfactory means was discovered for producing sustained oscillations.

To ascertain the number of sparks per second which was necessary to determine articulate speech, a phonograph cylinder was taken and grooves were cut in it longitudinally. It was found in this way that practical transmission could be accomplished with 10,000 breaks per second. It is believed now that this number is unnecessarily high, possibly owing to the fact that it was impossible to cut the grooves on the cylinder without producing ridges. The lower limit may be fixed in another way.

Electrical circuits met with in actual working have resistance, self inductance, capacity, and leakance. Heaviside gave the differential equations for the pressure and current over such circuits when alternating voltages were applied, but, no method of solution being known, the mathematical treatment of such circuits was restricted to cases where one of the constants was neglected, until Dr. A. E. Kennelly in a masterly series of papers gave the complete solution.

The results were immediately found applicable to a great variety of problems, such as the transmission of signals through cables and of telephonic speech through various types of circuits.

In this way Dr. Kennelly[1] by comparing the results obtained by Dr. Hammond V. Hayes[2] in practical telephonic transmission over loaded lines with the theoretical values of the current for different harmonics showed that harmonics above 2,000 per second could be neglected for telephonic transmission.

The writer has never succeeded in obtaining good talking with such a low frequency, but under favorable conditions fairly satisfactory speech may be obtained with 5,000 interruptions per second. For really good transmission, however, the radiation must be practically continuous, for if the spark frequency is less than 2,000 per second there is a disagreeable high pitch note in the telephone, not noticeable, perhaps, at first, but apt to become annoying with use. The most satisfactory way is, of course, to use a source of sustained oscillations.

It fortunately happens that for wireless telephonic purposes it is inadvisable to use a wave frequency of less than 25,000 per second, on account of the difficulty in radiating energy with low frequencies.

The receiver must, of course, be continuously responsive. If, for example, it had to be tapped back in order to restore it to the responsive condition, speech could not be transmitted.

It must also give indications proportional to the energy received or the character of the speech will be distorted.

It must also respond with sufficient rapidity. If, for example, it takes a thousandth of a second to restore itself to its original resistance the receiver will obviously not record the higher harmonics. I have experimentally determined that a receiver which restores itself in the ten thousandth part of a second acts with sufficient rapidity.

History of the Development of Wireless Telephony.

The writer has been asked on several occasions how the wireless telephone came to be invented. In November, 1899, shortly prior to the delivery of my previous paper, while experimenting with the receiver shown in Fig. 3 of that paper, I made some experiments with a Wehnelt interrupter for operating the induction coil used for sending.

In the receiver mentioned the ring of a short-period Elihu Thomson oscillating current galvanometer rests on three supports, *i. e.*, two pivots and a carbon block, and a telephone receiver is in circuit with the carbon block. A storage battery being used in the receiver circuit it was noticed that when the sending key was kept down at the sending station for a long dash the peculiar wailing sound of the Wehnelt interrupter was reproduced with absolute fidelity in the receiving telephone. It at once suggested itself that by using a source with a fre-

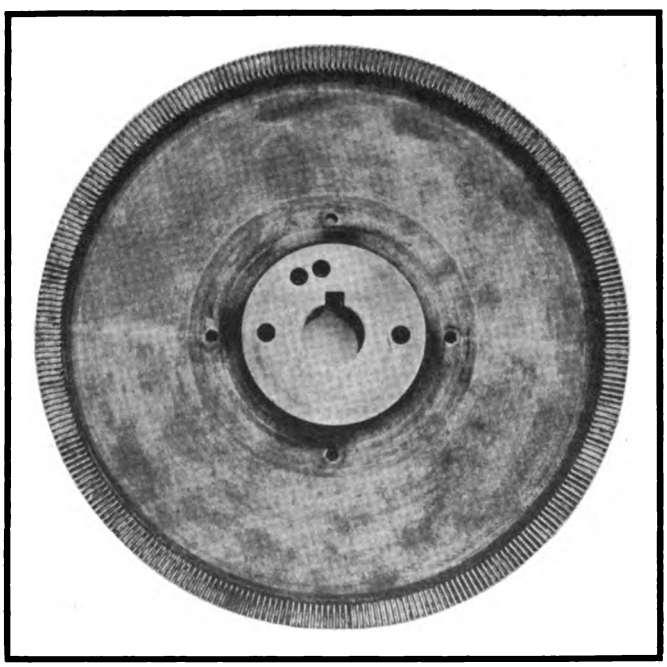

Fig. 2—Field Disk of High Frequency Alternator.

*Abstract of a paper presented at the 25th annual convention of the American Institute of Electrical Engineers.

[1]Kennelly, "Distribution of Pressure and Current Over Alternating-Current Circuits." *Harvard Engineering Journal*, 1906, page 43.

[2]Hayes, "Loaded Telephone Lines in Practice." *Transactions International Electrical Congress*, St. Louis, Vol. 3.

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quency above audibility wireless telephony could be accomplished.

Professor Kintner, who was at that time assisting me in these experiments, and to whose aid their success is very largely due, was kind enough to make the drawings for an interrupter to give 10,000 breaks per second. Mr. Brashear, the celebrated

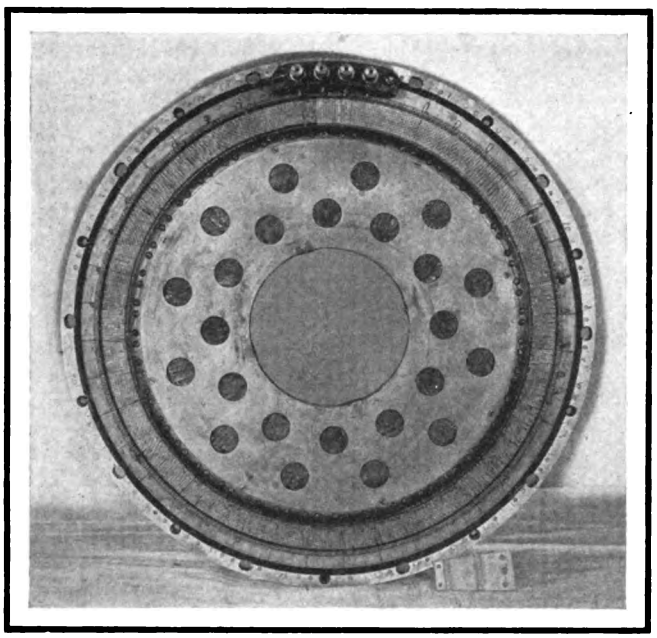

Fig. 3—Armature and Field Coils of High Frequency Alternator.

optician, kindly consented to make up the apparatus, and it was completed in January or February, 1900.

The experimental work was, however, delayed as the writer was at that time transferring his laboratory from Allegheny, Pa., to Rock Point, Md., and it was not until six months later that the stations at that point were completed and a suitable mast was erected for trying the apparatus.

The first experiments were made in the fall of 1900 with the above mentioned apparatus which was supposed to give 10,000 sparks per second, but which probably gave less. Transmission over a distance of one mile was attained but the character of the speech was not good, and it was accompanied by an extremely loud and disagreeable noise, due to the irregularity of the spark.

By the end of 1903 fairly satisfactory speech had been obtained by the arc method above referred to, but it was still accompanied by a disagreeable hissing noise. In 1904 and 1905 both the arc method and another method in which the 10,000 cycle alternator above referred to was employed, had been developed to such an extent that the apparatus could be used practically and sets were advertised and tendered to the U. S. Government. The transmission was, however, still not absolutely perfect.

By the fall of 1906 the high frequency alternator had been brought to a practical shape and was used for telephoning from Brant Rock to Plymouth, a distance of 11 miles, and to a small fishing schooner, this being the first instance in which wireless telephony was put in practical use. The transmission was perfect, and was admitted by telephone experts to be more distinct than that over wire lines, the sound of breathing and the slightest inflections of the voice being reproduced with the utmost fidelity.

As it was realized that the use of the wireless telephone would be seriously curtailed unless it could be operated in conjunction with wire lines, telephone relays were invented both for the receiving and transmitting ends, and were found to operate satisfactorily, speech being transmitted over a wire line to the station at Brant Rock, retransmitted there wirelessly by a telephone relay, received wirelessly at Plymouth and there relayed out again on another wire line. On Dec. 11, 1906, invitations were issued to a number of scientific men to witness the operation of the wireless transmission in conjunction with the wire lines. A report of these tests appeared in the AMERICAN TELEPHONE JOURNAL of Jan. 26 and Feb. 2, 1907, the editor being one of the men present.

In July, 1907, the range was considerably extended, and speech was successfully transmitted between Brant Rock and Jamaica, L. I., a distance of nearly 200 miles, in daylight and mostly over land, the mast at Jamaica being approximately 180 feet high.

In 1907 several European experimenters succeeded in transmitting speech wirelessly, using some of the earlier forms of the writer's arc method, and some months ago the vessels of our Pacific squadron were equipped with wireless telephones, using this arc method, by another American company.

METHODS AND APPARATUS.

Fig. 1 shows a general view of one type of high frequency alternator. It is driven by a motor and a DeLaval gear. It has been operated at 96,000 cycles per second, but is generally run at 81,700.

Fig. 2 shows a field disk; it is 12 inches in diameter and there are 300 slots on it.

Fig. 3 shows the armature and field coils. There are 600 armature slots, each containing two turns of 13 mil wire. The field current is 5 amperes. The resistance of the armature is 6 ohms; it gives 160 volts and about 7 or 8 amperes. Other armatures have been constructed having a resistance of 4 ohms. For some work double armatures are used giving about 270 volts. The output of the single armature machines at 81,700 cycles is approximately one kilowatt. The output of the double armature machine is approximately 2 kilowatts.

Other types of high frequency alternators are under construction. One type shown in Fig. 4 is designed for use on shipboard. The armature disk is 6 inches in diameter and two armatures are used. It is arranged to be mounted on gimbals and to be driven by a steam turbine connected to the steam pipe by flexible armored steam hose. The frequency is about 100,000 and the output about 3 kilowatts.

Another type, which is at present being constructed by Mr. Alexanderson, to whose efforts the success of this type of generator is largely due, is designed to have an output of 10 kilowatts. Designs have been made for a generator of still larger size with a calculated output of 50 kilowatts and a frequency of 50,000. This machine is intended for transatlantic work.

For some of these machines, instead of driving by gear or

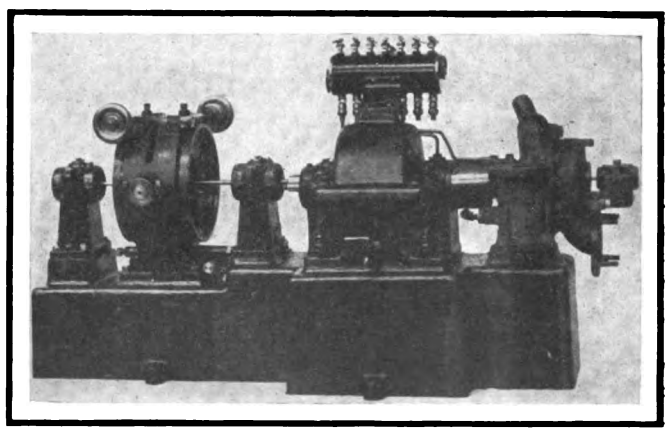

Fig. 4—High Frequency Alternator for Shipboard Use.

steam turbine, a special two-cycle motor has been devised, to operate at a frequency of 500 cycles per second.

The high frequency alternator method is believed to possess a number of advantages over other methods, inasmuch as it is set in operation by merely opening a steam valve and has no complicated electrical apparatus or circuits of any kind. The speed is regulated by the steam pressure, this being accomplished by an electrically operated reducing valve.

(To be continued.)

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The Measurement of Sound Intensities

By Bruce V. Hill.

In the transmission of power one of the prime considerations is always that of efficiency. In telephony, in the transmission of speech, at least, this is not true, the total amount of energy consumed being in any case relatively small. In ringers, however, the efficiency might very well be taken account of, and there have been a number of attempts made to measure or compare the intensities of the sounds produced by these devices. As will be shown, it is not merely a method of measuring sound intensities that is needed here. It may be of interest, however, to mention briefly some of the most important experiments that have been made on the measurement of sound intensities. To describe these adequately would require many pages with full illustrations. References are given in each case, however, and from these the reader may get more complete information if he desires to look them up.

We are now able to compare the powers of different illuminants with considerable ease. The methods for doing this depend on having two portions of a screen illuminated by the sources to be compared and so adjusting their distances that the illumination is equal over the screen, or to adjust the distances of the sources so that they cast equally intense shadows, or so that, when they are caused to fall upon the eye in rapid succession, no flicker is observed. In all of these methods we are served by the property of light which makes its rays or trains of waves travel in straight lines, and in all the methods but that last-mentioned the lights must be of very nearly the same color. Anyone who has tried to tell whether a red light was brighter than a blue one, or vice versa—and this is a case that happens very often in sugar tests and the like—knows how impossible it is to make any definite comparison whatever. None of these methods are applicable in the case of sound, for the waves here are so long, and hence the amount of diffraction so great, that no shadow can be obtained. The third method referred to above, for light, depends upon the fact that if the eye is exposed alternately, for very short intervals, to lights of different hues the two will blend into a single color. Red and green, for example, would form a whitish mixture. With sounds this would not be the case. The tones "C" and "E" would always be "C" and "E." The ear would call the combination a major third, but would still be able to distinguish the separate tones.

The intensity of light radiation can also be measured by a bolometer or radiometer as so much energy. Of two rays thus compared, one might be a heat ray of much greater energy than the other which might be a light ray, but the former would be wholly invisible and the latter bright. Comparison of the relative energy of the two would not tell us anything of the light value of either. All of the methods now to be described for the measurement of sound intensities depend upon the measurement of energy. The value of these methods will be discussed later.

The action of the microphone has long been known. If in the circuit with a battery and a receiver is placed a carbon rod resting loosely at the ends in a carbon support, a very slight jar varies the resistance of the contacts and causes a sound in the receiver. The ordinary transmitter is but a form of microphone. A number of years ago, William Weber suggested using the currents in the secondary of a circuit like that of a local-battery telephone set as a measure of the intensity of sounds falling upon the transmitter. It has been shown mathematically by the present author that the electrical energy in the secondary of such a circuit is only approximately proportional to the energy of the sound wave in air when the latter is of the simplest form. In noises, such as those given out by calling apparatus, the relations would be very complex. Moreover the heating and packing of the transmitter render it very unreliable for quantitative measurements. Experiment shows that no satisfactory comparisons of sound intensities can be made in this way.

In 1878 and 1881 Vierordt published several papers in which he described methods for comparing sound intensities by the distances to which they were audible. He found that the law of inverse squares does not hold as in the case of light, but the intensities decreased as the first power of the distances from the ear increased. Here he depends upon the ear, which is very unreliable especially *at the threshold of sensation.* Rayleigh has found that under certain circumstances no regular relation seems to exist between the loudness of the sound and the intensity of the sensation it causes. The ear is more sensitive to some pitches than to others. A few months ago, the author took two ringers of different design, but of which one was beyond doubt much louder than the other, and had an assistant sound them at irregular intervals while the observer walked away from the ringer. A still night was selected for the experiment. While there was no doubt that one of the two ringers was much louder than the other, the weaker one could be heard nearly as far as the stronger one, due to a faint but very piercing overtone in the former.

Next in point of time came the suggestion of Overbeck. He used a microphone with but two carbon contacts, the one resting lightly on the other, and the whole mounted upon a resonance board. He showed that the increase of resistance of this arrangement when acted upon by a sound wave was approximately proportional to the intensity of the sound falling upon it. It was useful only for a moderate range of pitch and intensity.

Dvorak describes a number of contrivances depending upon the repulsion of resonators or of light aluminium vanes. In a similar way Prof. Wood, of Baltimore, has made a sonometer, in which the speed of a set of rotating vanes depends upon the intensity of the sound falling upon it, but which cannot be used to measure it. Lord Rayleigh suggested placing a light mica vane in a tube, at an angle of 45 deg. to the axis of the tube. The open end of the tube was to be covered with an elastic membrane and placed at the node of a standing wave of the sound to be studied. The rotation of the vane was a measure of the intensity of the sound. E. Grimsehl used a similar arrangement.

None of the methods so far described are of more than incidental interest, except possibly that of Weber. Prof. Max Wien, in 1899, constructed his *optical telephone.* Upon the diaphragm of a special receiver he placed a small mirror which vibrated with the diaphragm, thus giving a measure of the amplitude of the latter's vibrations. Later he placed the mirror directly on a diaphragm actuated by the wave to be studied without the use of the telephone. This arrangement also would not be of use with complex tones like those of ringers.

G. Stern used a special microphone to study the intensity of sound in various parts of a room. His method is of no value to us, however.

Mr. B. F. Sharpe used the following method: One total reflecting mirror of a Michelson refractometer is made small and light and mounted upon a thin plate forming part of the wall of a Helmholtz resonator. The objective of the telescope was mounted upon the prong of a tuning fork of the same period as the tone studied. There was formed a series of oblique bands whose inclination is a measure of the intensity of the tone.

It has been shown that a wave of sound exerts a pressure upon a screen placed in its path. Altberg constructed an apparatus consisting of a reflecting wall in which there was a small circular hole. In this hole fitted loosely a plunger which was held in place by the torsion of a small steel wire. The deflection of a mirror attached to the wire, due to the pressure of

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a sound wave on the plunger was a measure of the intensity of the sound. To get intensity enough to measure in this way, Altberg had to have a sound so loud that he was obliged to stop his ears. If one attempts to make the apparatus sensitive enough to measure ordinary intensities of sound it is so delicate that the slightest draught in the room sets the plunger in motion. This cannot—like the radiometer—be placed in an air-tight case, since it is the waves in the air that are to be measured.

All of the methods referred to here are applicable only to the comparison of pure tones except that of the microphone and that of the torsion balance just described. Neither of these has yet been applied successfully to the measurement of a sound like that of a ringer.

Even if we were able to compare accurately the energies of two sounding bodies it is doubtful whether we would be any the wiser as to their relative merits as calling devices. One might compare the energies of a *dull roar* and a *shrill whistle*, but, even if the energies were the same, it might be hard to say which would attract attention the most readily. Under most conditions the chance would be greatly in favor of the whistle. Moreover it is probable that the very rattle of a ringer adds to its efficiency in calling the subscriber. A noise that is somewhat unpleasant will undoubtedly attract one's attention more quickly than an equally intense one that is harmonious. It seems evident that some method, very different from any of those enumerated here, will have to be devised if ringer efficiencies are to be compared directly.

REFERENCES.

W. Weber, Abhandlungen ueber Elektrodynamischemessungen, Bd. 1, p. 297.
Froelich, Ann. d. Phys. Bd. 8, p. 563, 1878.
Elect. Tech, Zeitschr. 10, p. 65, 1889.
Oberbeck, Ann. d. Phys. Bd. 13, p. 222, 1881.
Cent. Zeitung f. Opt. u. Mech. Heft 18, 1884.
C. Vierordt, Zeit. Schr. f. Biol. Bd. 17, p. 361. Bei-blaetter zu den Ann. d. Phys. Bd. 6, p. 344. Ann. d. Phys. Bd. 18, p. 471. Arch. sc. Phys. (3) 9, p. 495. Zeitschr. f. Biol. (1878), p. 300, and Bd. 17, p. 361. Bei-blaetter zu den Ann. d. Phys. Bd. 2, p. 557.
V. Dvorak, Zeitschr. f. Phys. u. Chem Unterricht, Bd. 6, p. 186. Bei-blaetter Bd. 18, p. 321. Fortschritte d. Phys. Bd. 32, p. 316. Pogg. Ann Bd. 157, p. 42-73. Zeitschrift. f. Inst. Kunde. (1883), p. 76.
Max Wien, Ann. d. Phys. Bd. 34, p. 836; Bd. 42, p. 593; Bd. 44, p. 681. Bd. 36, p. 835.
E. Grimsehl, Ann. d. Phys. Bd. 34, p. 1028.
G. Stern, Ann. d. Phys. Bd. 42, p. 622.
B. F. Sharpe, Science, Vol. 9, p. 808, 1899.

A Study of Multi-Office Automatic Switchboard Telephone Systems*

By W. Lee Campbell.

In manual systems an operator's daily quota of connections is reduced when part of the calls which she handles must be trunked to other offices. This effect of trunking on the operator's work is indicated by curve *A*, Fig. 7, which gives the number of flat-rate busy-hour connections which one of the largest manual operating companies has found that an average "A" operator will make with various percentages of trunked calls. It is, therefore, necessary in a multi-office manual system to install and to provide space for more "A" operators' positions, as well as to install and provide space for "B" operators' positions and to provide increased space for rest rooms, etc.

As an illustration, in Fig. 8, curves *D*, *F* and *E* show respectively the number of "A" operators' positions, the number of "B" operators' positions, and the average number of lines per "A" operators' positions for a hypothetical 10,000-line system with different numbers and sizes of offices. The numerals along the bottom of the figure which indicate the various numbers and sizes of offices, have the following significance:

1 1/4	represents	1 office of 8000 lines
		1 office of 2000 lines
1 2/4	"	1 office of 6700 lines
		2 offices of 1650 lines each
1 3/4	"	1 office of 5725 lines
		3 offices of 1425 lines each
2	"	2 offices of 5000 lines each
2 1/4	"	2 offices of 4450 lines each
		1 office of 1100 lines
2 2/4	"	2 offices of 4000 lines each
		2 offices of 1000 lines each
2 3/4	"	2 offices of 3650 lines each
		3 offices of 900 lines each
3	"	3 offices of 3333 lines each
4	"	4 offices of 2500 lines each
5	"	5 offices of 2000 lines each
6	"	6 offices of 1667 lines each
7	"	7 offices of 1429 lines each
8	"	8 offices of 1250 lines each
9	"	9 offices of 1111 lines each.

The number of "A" and the number of "B" operators' positions grows quite rapidly as the number of offices is increased, while the lines per "A" operators' positions diminish.

*Abstract of paper presented at twenty-fifth annual convention of the American Institute of Electrical Engineers; continued from issue of July 4.

In working out these curves the percentage of outgoing trunk calls from any office was calculated by the formula, trunking per cent $= 100 \frac{A-B}{A}$ multiplied by 0.75; where A is the total number of lines in the system, B equals the number of lines in the office under consideration, and 0.75 is a factor which experience indicates will allow under average conditions for the community of interest between the subscribers in an office district. Of course, in a study of a particular locality this factor should, if possible, be accurately determined; it may be as small as 0.4 or as large as 1.5.

Curve *B*, Fig. 8, gives the approximate cost per line of the central office equipments installed as derived from the data used in curves *D*, *F* and *E* previously mentioned. It will be noted that although more positions are necessary than in a single office, the cost of each position is reduced by a decrease in the line equipment and in the number of multiple jacks per position, so that there is not a great variation in the total switchboard cost. In the same Fig. 8, curve *C* shows the cost per line of the buildings for the various sizes and numbers of offices in the divided system. The cost of space required for executive offices, storage, etc., is not included in these figures, nor do they include the cost of land and furnishings. Curve *A* shows the combined cost per line of central office equipment and buildings. It will be noted that the greater cost of buildings is, to some extent, counterbalanced by a reduction in the cost of the equipment. The small increase would in any event be of little moment in comparison with the saving in the cost of wire, cable and conduit plant, which might be secured by plant division. It would, therefore, appear that we must look further for the cause of the objections to multi-office manual systems.

Before discussing operating expenses, however, let us see what effect plant division has on the first cost of automatic central office apparatus and buildings. To illustrate the effect, the curves in Fig. 9 have been worked out, using the same 10,000-line system and the same number and sizes of offices employed in Fig. 8 for the manual system. The cost, installed, of central office equipment is somewhat increased by division, as will be noted by reference to curve *B*. The central office space required is also greater, as shown by curve *C*, Fig. 9, and by curves *A*, *B*, *C* and *D*, Fig. 10. The slow increase in the combined cost of equipment and building as more offices are added

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is shown by curve *A*, Fig. 9. The increases are of small import in comparison with the saving in the underground and aerial construction secured by using a larger number of offices.

Taking up the subject of operating expenses, the writer would direct attention first to curves *A* and *C*, Fig. 11, which show average annual operating and maintenance labor cost for manual central offices of from 1000 to 14,000 lines, doing no trunking

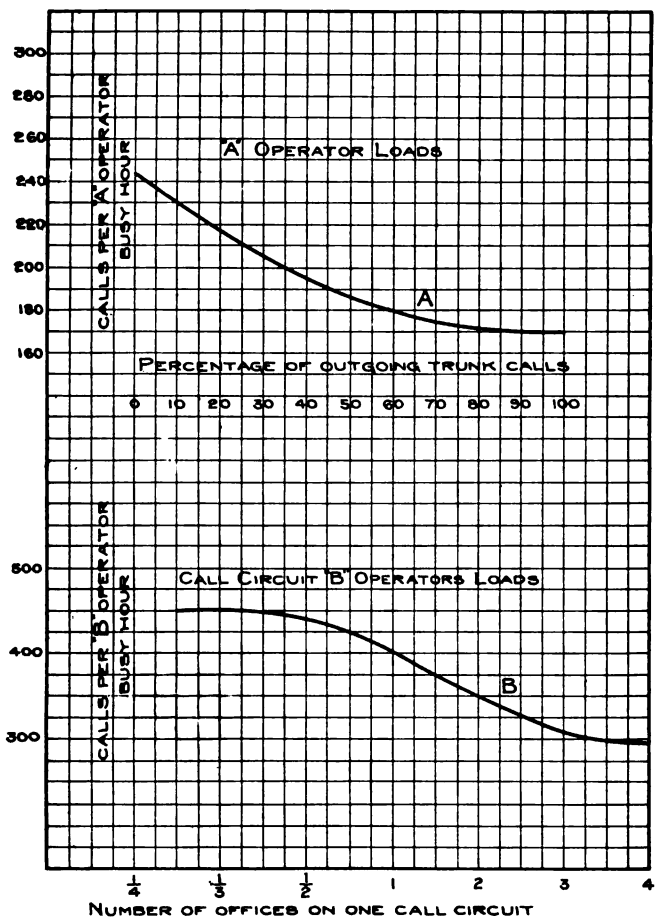

Fig. 7—Effect of Trunking on Operators' Work in Manual Systems.

and handling the number of calls per line per day indicated by curve *A*, Fig. 1. Curves *B* and *D*, Fig. 11, show, respectively, the total annual cost and the annual cost per line of all central office labor for automatic offices of from 1000 to 14,000 lines. These figures are averages of the labor costs obtained from a considerable number of automatic switchboard operating companies.

The writer would next direct attention to curves *A* and *B*, Fig. 12, which give the central office labor expense as shown in Fig. 11, plus cost per line per annum of certain central office equipment and central office building charges that are materially affected by plant division. Curve *A* is for manual offices of from 1000 to 14,000 lines, no trunking, and curve *B* gives similar data for automatic offices. These figures include insurance, taxes, interest and depreciation on central office equipment and buildings, renewals for central office equipment, and the cost of lighting and power.

Insurance of the central office equipment in fireproof buildings is taken at 1 per cent per annum. Although several companies operating automatic apparatus have informed the writer that they secured a lower rate than that which they could get on manual equipment, it does not appear that the rating authorities have made any general rule which would assure a reduction. Since, however, much of the damage done to switchboards by fire is caused by blazes originating within the apparatus itself, and since the insurance companies exempt themselves from losses caused by such blazes, it would seem that fire loses would be smaller with automatic equipment than with manual. Manual switchboards are largely built of inflammable material and are incased in wooden cabinets. Also, if a blaze should start in one end of a manual board there is little in the construction of the board to prevent it from sweeping through the entire length. Automatic switchboards are divided up into small separated sections so that a blaze in one would have very little opportunity to leap across to another. The apparatus itself is made up almost entirely of metal.

Taxes on both types of equipment are figured at the rate of 1.5 per cent per annum; interest is figured at 6 per cent per annum for both.

Depreciation on manual central office equipment is figured on an average life of 10 years. Of course, many parts of the switchboard must be replaced in less time; for example, cords in an average time of 1.5 years; plugs in two years; keyboard lamps, three years; answering jacks, five years, etc. These, however, are believed to be covered by including a 2 per cent charge for maintenance, materials and renewals. Depreciation on automatic equipment is calculated on a life of 12 years. Although no automatic plants, to the best of the writer's knowledge, have been in continuous service for this length of time, he has found that plants which have been in operation for seven or eight years show very little wear. While some such plants have been replaced by new ones, it has been because it was be-

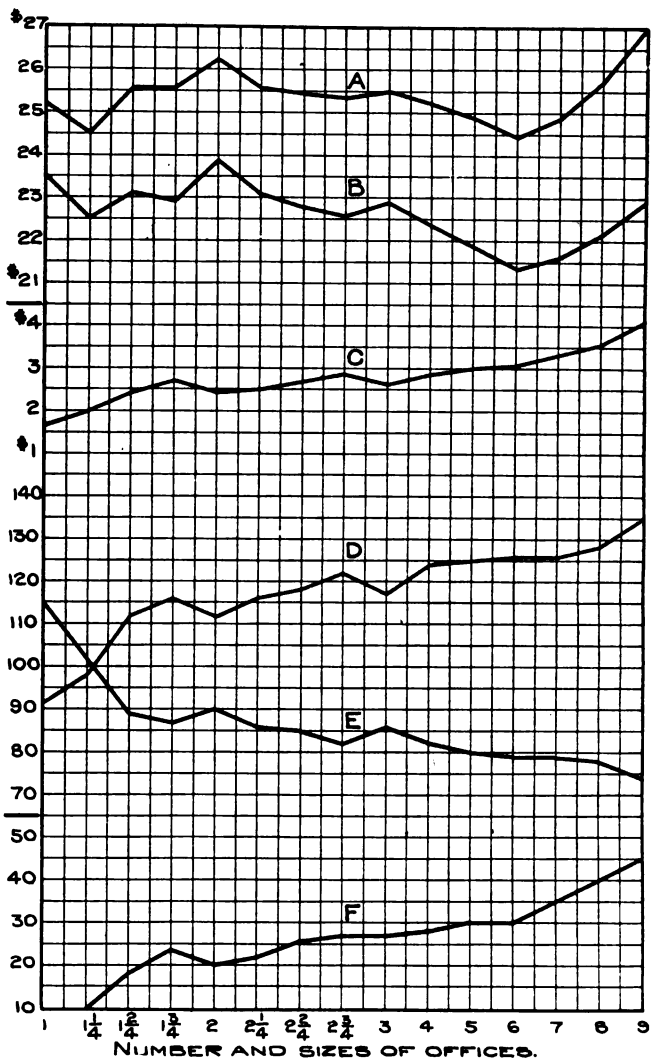

Fig. 8—Study of 10,000 Line System, with Various Numbers and Sizes of Manual Offices.

lieved that better service and decreased operating costs, made possible by the new and improved equipment obtainable at the time the change was made, would pay for making it before the life of the original plant was exhausted. As an example, showing the effect of wear and tear on an automatic switchboard there is in Fall River, Mass., an automatic plant which has been in operation for seven years; at this plant the only appreciable wear is on the shaft wipers of the busier trunking switches.

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While these wipers could be renewed at a very modest expense, they will apparently last for some years yet. The wear on the equipment, which is individual to each subscriber's line, is hardly noticeable. In fact, an automatic switchboard has never been known to wear out, while manual switchboards are really worn out by the continued use of the parts by the operators. As the writer has already stated, such manual switch-

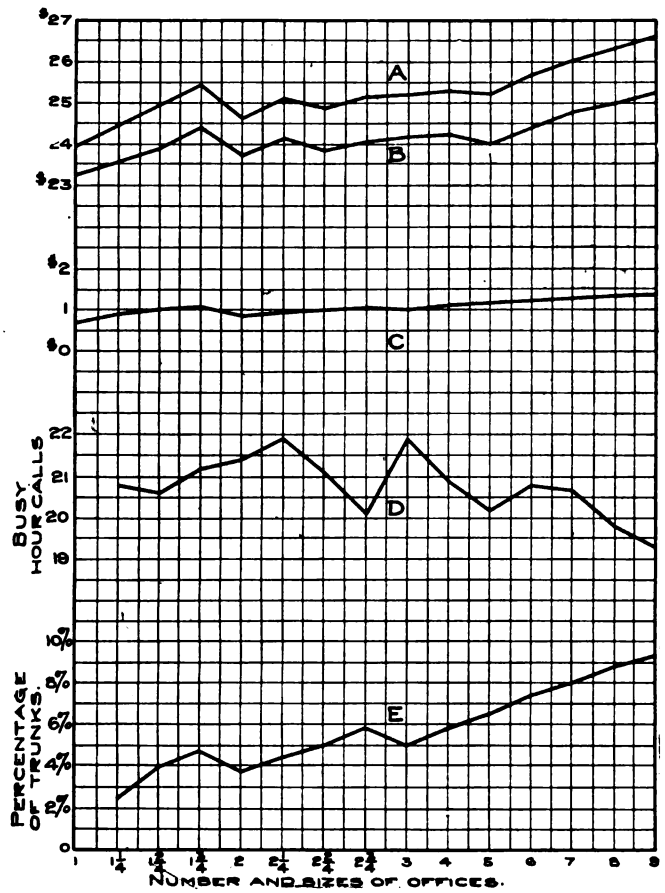

Fig. 9—Study of 10,000 Line System, with Various Numbers and Sizes of Automatic Offices.

board parts as cords, keyboard lamps, answering jacks, trunk jacks, etc., will need to be replaced at intervals during the life of the board. It is also found that the keyboards and plug shelves made of wood and sole leather become so worn from the continual contact of the operators' fingers and the rubbing of the cords, and so battered by the constant pounding of the plugs that they must be replaced in six or seven years on a very busy board. In 10 years, or sometimes even less, the keys, multiple jacks, multiple cables, etc., are generaly in such condi-

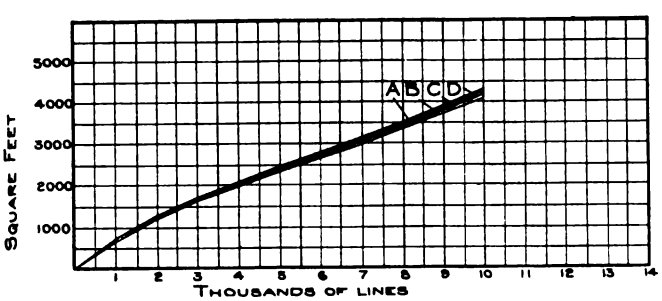

Fig. 10.—Floor Space Required for Automatic Equipment of 100,000 Lines; A, No Trunks; B, 25% Each Incoming and Outgoing Trunk Calls; C, 50% Each of Trunk Calls; D, 66% Each of Trunk Calls.

tion that it becomes necessary to replace the entire switchboard regardless of whether it has become obsolete or not.

Ten to 15 years ago telephone apparatus was being developed so very rapidly that the life of a board was not more than five or six years. At the end of that time the board would be so out-of-date that competition or a proper regard for service or for operating expenses would usually compel its replacement by a more modern one. That time ended in manual practice with the perfection and introduction of the common battery multiple board. No radical improvements have since been made. Automatic switchboards have also reached a somewhat similar plane of development. For illustration, in the Fall River system installed in 1901, a subscriber makes a call by means of a dial and secures service very similar to that in the most modern plant. Looking at the automatic switchboard itself, we find the so-called grouping system, the automatic selection of trunks, push-button ringing and other essential features of the latest equipment. It is true that great improvements have been made in automatic equipment in very recent years, such as the introduction of common battery service, party lines, line or individual switches, improved methods of manufacture, installation, etc., but these are all points which appeal to the manufacturer or to the operating company, while improvements in the general appearance of the telephones are about the only ones made in the last seven or eight years which are of much interest to the telephone users. Therefore, considering the service only, and viewing the matter from the standpoint of the telephone

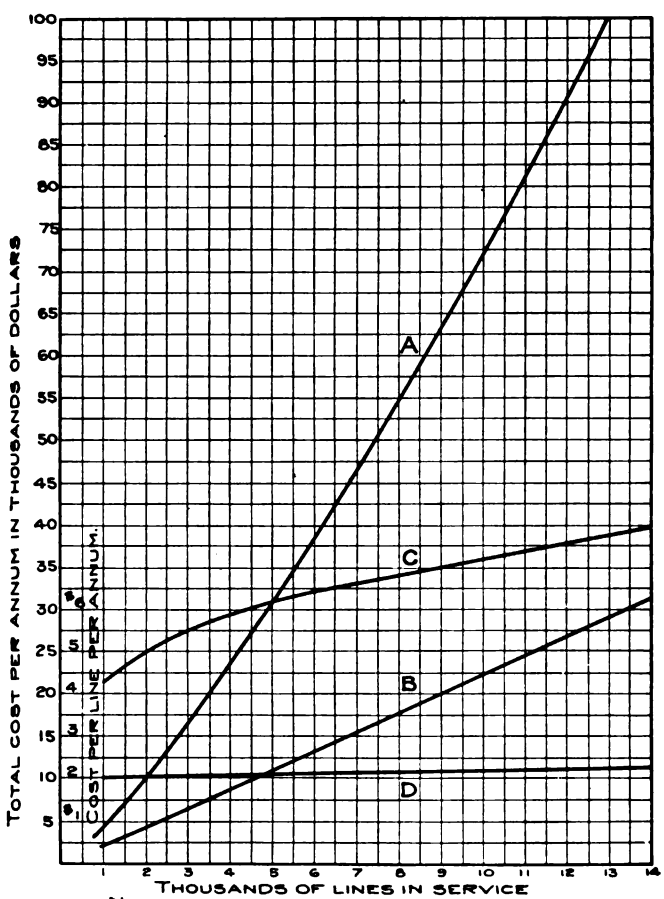

Fig. 11—Labor Costs for Operating, Repairing and Maintaining Manual Central Office Equipment.

subscriber, the writer believes it reasonable to conclude that there is little probability in the near future of a manual switchboard being rendered obsolete by a more improved manual board or of an automatic switchboard being put out of the arena by an automatic switchboard giving better service. He, therefore, has taken the life of a manual switchboard at the full amount that a consideration of wear and tear only will permit; and, in order to be perfectly conservative, has placed the life of an automatic board at but two years longer, although there is no reason to suppose that it would not still be good for a number of years of service at the end of that time. The amount which must be set aside annually at 6 per cent compound interest to equal 100 per cent in 12 years is 6 per cent of first cost. Therefore, this percentage is used in calculating depreciation on automatic central office equipment, while for manual

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equipment the depreciation charge is taken at 7.5 per cent, which is the amount which must be set aside annually at 6 per cent compound interest to equal first cost in 10 years.

Looking into the matter of maintenance, material or renewals for automatic central office equipment, the writer has found from an investigation of a number of automatic plants that the renewals for the switchboard proper amount on the average to

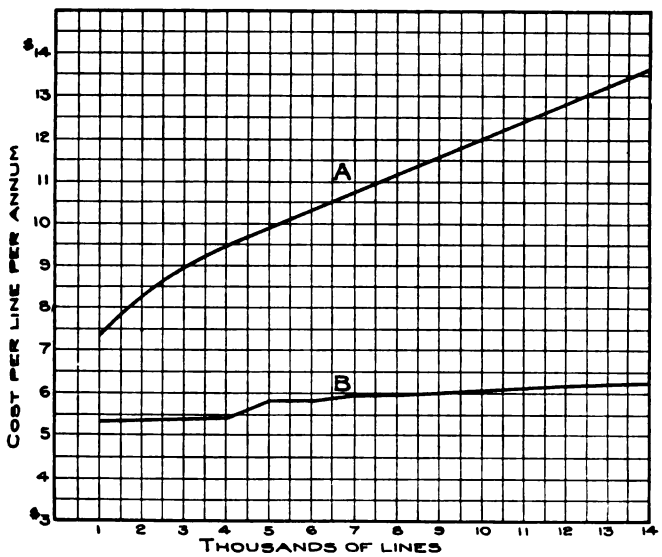

Fig. 12—Manual and Automatic Central Office Labor Expense and Other Charges.

0.2 per cent per annum on the first cost of the central office equipment. The power plant, main distributing frame and other parts of the central office equipment increase the renewals item, however, and in order to cover everything it has been taken at 0.5 per cent for automatic offices.

The cost of power per originating call handled is about twice as much for automatic switchboards as for most of the manual switchboards used by the "Independent companies." The amount of current consumed is almost the same, 0.006 of an ampere-hour. Automatic plants generally use a battery of 46 volts, about twice the voltage of the usual manual battery, although in large plants where the lines are long 40-volt batteries are sometimes employed in manual practice. The manual switchboards generally used by the Bell companies require considerably more current than those used by the Independent companies. The amounts used by the Independent boards have been taken in working out curves in this paper. Taking the cost of power, transformed and delivered at the switchboards, at 15 cents per kw-hour, gives a cost of $0.0216 per 1000 local calls for manual offices and of $0.0432 per 1000 local calls for automatic offices. The aditional cost per 1000 incoming trunk calls received at a manual office would be $0.0144. For automatic offices the additional cost for incoming trunk calls would be $0.004 per 1000, assuming that the number of calls trunked out from an office equals the number incoming.

The cost of lighting automatic central office equipment has been taken at $4 per 1000 lines per month, and for manual offices the cost of lighting the operators' positions, the switchboard room, operators' retiring rooms, terminal room, desks, etc., has been taken at $2 per switchboard position per month.

The annual charges on the central office buildings have been taken at the same rates for the two systems; that is, insurance on fireproof central office buildings has been figured at 0.5 per cent per annum, interest at 6 per cent, taxes at 1 per cent and depreciation and repairs at 2 per cent per annum.

(To be continued.)

Ohio Companies in Good Financial Condition

President Frank L. Beam, of the Ohio Independent Telephone Association, has just completed a tour of a large part of the State and says that the Independent telephone companies are all in good shape. The financial depression apparently has not had a bad effect upon them. He believes that, owing to the lower price of copper and other materials, there will be quite a little construction work in Ohio this summer. General conditions have changed somewhat within the past two months and there will be more building than was at first supposed. Most of the Ohio companies are in shape to take care of the construction work which they are planning and will not have to depend materially upon outside finances.

When the Kaiser Telephones

According to recent correspondence from Berlin, the Kaiser and the Kaiserin are the only persons in the German Empire who are sure of prompt and private telephone service. Somebody has just ascertained that telephone operators throughout the country have instructions not only to shut off the circuit so that nobody else can talk over it, but must themselves abandon the switchboard as soon as the signal arrives that either of their majesties is on the line. Operators must not restore the circuit for the use of the public or themselves return to the switchboard until the signal comes that the imperial conversation is ended.

When either the Emperor or the Empress calls for a connection, operators are to drop everything else and "put them through," but no conversation going on between mere subjects is to be broken off for their majesties' convenience.

If the Kaiser and his consort get good telephone service in consequence of these special dispensations they enjoy a distinction, it is asserted, among the millions of humans who try to use the telephone in the fatherland.

Reduction of Telegraphing by the Use of Printed Forms *

By O. C. Greene, *Northern Pacific Railway.*

There is no doubt that where there are any considerable numbers of routine reports of similar character, the use of an intelligently arranged blank form materially reduces the amount of telegraphing. When the requirements are known, it is a comparatively easy matter to make up a blank form, with suitable columns and headings, to meet them. An arbitrary designating letter should be placed at the top of each column and, when necessary, at the beginning of the line, which should, of course, be transmitted by the sending operator, to indicate to the receiving operator which space to use. Care should be used in selecting this index letter to use Morse characters, which will not be apt to combine easily with those of the numbers or words most likely to follow it.

To obviate this difficulty the receiving operator is likely to experience in finding the proper place, especially if the blank is large, and the sending operator inclined to be very ambitious, the spacing should be rather liberal, and the subdivisions of the form should be separated by heavily ruled lines; otherwise, so many errors due to operators using the wrong spaces, may follow, that the saving effected by the use of the blank is likely to be largely offset by the number of messages made necessary to secure corrections.

Multiplicity of forms is objectionable. As a general thing the telegraph tables are pretty well crowded, and considerable time may be lost by operators looking for the proper blank when there are a great many to select from. While the use of blank forms is undoubtedly advisable when the amount and character of business justifies it, there is, therefore, a chance of overdoing it. Conditions frequently change, and it will be found that many times a slight change in some of the established forms can be made to take care of this change in conditions rather than making a new blank for the purpose.

The Northern Pacific Railway being long, and the general offices located at one end, necessarily carries on a great deal of its business by wire, hence a large number of forms are in use, which greatly reduces the volume of telegraphing.

*A paper read before the Association of Railway Telegraph Superintendents at Montreal, June 25, 1908.

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Legal Impediments to Consolidation*

By M. L. Clawson.

The Supreme Court of Indiana has never passed upon the question of compulsory consolidation. The Supreme Court of the United States has never had this matter brought to its attention, but until the theory of our competitive system is wiped from our legislative and constitutional provisions, and until the whole theory of our common law as it existed in times past, and it exists by decisions to-day, is changed, compulsory consolidation cannot and will not be sustained by the courts of this country.

By the anti-trust law of Indiana, by the constitution of our State, by the Federal anti-trust law, by the Inter-State Commerce Commission and the statute under which it acts, and by the Federal constitution, competition between public utility corporations is a part of our laws and public policy, and no State legislature can, within constitutional bounds, compel public utility corporations to consolidate in the sense and within the meaning that the courts have given to that word.

In the Pearsall case it was stated "that the people in their sovereign capacity, or the legislature as their representatives, may deal with the charter of a railway corporation so far as it is necessary for the protection of the lines, health and safety of its passengers or the public, or for the security of property or the preservation of the public interests, provided, of course, that no vested rights are thereby impaired." In other words, the legislature may not destroy vested rights, whether it is expressly prohibited from doing so or not.

As applied to railroad corporations it may reasonably be contended that the term "vested rights" extends to all rights of property applied by executed contracts, as well as all such rights as are necessary to the full and complete enjoyment of the original grant of property legally acquired subsequent to such grant.

If, for example, the legislature should authorize the construction of a certain railroad, and by a subsequent act should take away the powers to raise funds for the construction of the road in the usual manner, by a mortgage, or the power to purchase stock or equipment, such acts perhaps might be treated as so far destructive of the original grant as to render it valueless.

In the Pearsall case the law is correctly laid down that unless the power to alter the charters of the corporation is reserved, it is probable that prohibition against the voluntary consolidation of competing corporations will not affect contracts and rights already acquired under a power to consolidate. Pearsall vs. Great Northern Railroad Company, 161 U. S., 646.

So the doctrine that the State cannot wipe out a contract, and has no right to compel the course of business of a corporation with reference to that contract, is admitted even in cases where voluntary consolidation has been effected. If the State is powerless in that instance, with much less reason it is said that the State has the power to act where the course of the corporate business is radically changed, the title to the corporate property wiped out, the interest of warring and diverging stockholders blended and forced into apposition without their consent and against their will, and the investment value of millions of dollars changed by the caprice of the legislative assembly.

Involuntary consolidation cannot be considered as being within the police power of the State. The State is given no such power in the Indiana constitution. The State reserved no such powers in the consolidation of the telephone companies of this State, and there has been no statute reserving the right to such State passed by the legislative assembly of this commonwealth and at any time during the creation of the numerous telephone companies in this State. It has even been held that the remedies for the enforcement of a contract existing in a State when the contract is made were a part of its obligations, and any repeal or subsequent change of these remedies which substantially obstructs or retards their enforcement or lessens the value of the agreement, impairs its obligations, and is unconstitutional and void.

Harrison vs. Remington Paper Company, 140 Fed., 385; Myers vs. Knickerbocker Trust Co., 105 Fed., 111.

In a late case, the Pittsburg-Allegheny Consolidation case, it was decided that:

"The powers, rights, charters, franchises and privileges held by a municipal corporation are held at the will of the legislature. The legislature has complete control over the property of the municipality, and even over its rights and obligations."

The property of a city is of two kinds. There is a well-recognized distinction between property owned by it in its governmental capacity as an administrative agent of the State and that owned in its proprietory capacity for private benefit for its own use. The legislature has not the same broad powers of control over the latter. The corporation, in respect to it, stands in the same position as a private corporation, or an individual, and is protected in the same way. 24 N. J. Law, 385; Patterson vs. Society; Cemetery vs. Boston, 158, Mass., 509; Detroit vs. Detroit Road Co., 43 Mich., 140.

But while the legislature can alter or destroy its municipal corporations at will, yet if the corporation has entered into a contract, as, for example, issued bonds or incurred any indebtedness, legislation cannot be used to defeat contracts already entered into. With this limitation it would appear that the legislature has almost unlimited power under the Federal constitution over municipal corporations.

If the State cannot compel consolidation of municipal corporations, whence does it derive its power to compel public utility corporations to consolidate? Hunter vs. Pittsburg, 28 Supreme Court Reports, Page 40. In re. Penn. Tel. Co., 48 N. J. Equity 91; 20 Atlantic, 846.

In all of our investigations we have found but very few cases, the argument of which can be used with any degree of legal certainty in determining the question of involuntary consolidation, but we have in mind one case known as the Chicago Lake Front case, officially entitled the Ills. Railway Co. vs. Illinois, 146 U. S., 387.

In this case the railway company sought to obtain title to lands along the tide waters of Lake Michigan. The court held that the title which the State of Illinois held to such lands bordering on Lake Michigan and a part of it lying within the State limits is different in character from the title of the State to lands intended for sale. They held that it was a title in trust for the people of the State, that they may enjoy the navigation of the waters, carry on commerce over them, have liberty of fishing therein, free from obstruction and interference from private parties, and it is not within the legislative power of the State to change this purpose by a grant whereby it surrendered its property and general control over the lands of an entire harbor, bay, sea or lake, though it may grant parcels thereof for wharves, piers, docks and other structures in aid of commerce, or parcels, which, being occupied, do not substantially impair the public interests in the waters remaining.

There was no express provision in the Illinois constitution that such lands were held in trust for the people of that State, but the Supreme Court wisely held that it was one of the implied clauses in the Constitution that even the Legislature did not have the right to bargain away a popular trust. In the same way it has been held that the Legislature cannot by an act derive the community of what is known as home rule.

*Abstract of a paper presented at the convention of the Indiana Independent Telephone Association, concluded.

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Though there is nothing in the constitution expressly reserving this power unto the different communities, yet by the very nature of our institutions and the history of our constitutional growth, the courts have held, and wisely held, that all legislative attempts to destroy this principle so firmly grounded in American life is invalid and unconstitutional. In this State the doctrine of home rule is recognized by several of our Supreme Court decisions. In the case of State vs. Denny, 118 Indiana, 457, the court said:

"The people still retain all power except that expressly delegated to the several departments of the State government, and one of the inherent powers of the people is the right of local self-government. In all the changes of policy, of dynasty, of peace and war and conquest, these organizations, to wit, municipal corporations have never been abated or abandoned. They are substantially at this time what they were before the Norman invasion. Wherever the Anglo-Saxon race has gone, wherever it has carried its language and its laws, these communities, each with a local administration of its own selection, have gone with it.

"The right of self-government lies at the foundation of our institutions. It is a sacred fundamental principle, sacredly guarded, and this right is still enjoyed by the people unless expressly yielded up and granted to one of the departments of the State government by the constitution." And the court decided that the people had not granted in their constitution to the Legislature the power to deal with this question.

We can, with just as much truth, say that the principle of individual proprietorship of property, which necessarily involves competition is as long standing as government; that it has been known in our jurisprudence ever since the Anglo-Saxon race battled for liberty; that it was deeply rooted in English history and imbedded in English law before the Norman invasion, and that wherever the Anglo-Saxon went, there went the competitive principle of industry.

If the State cannot compel a railway to sell a ticket at the legislative price, wherein does the State secure the grant of power to compel the railway to sell its stock certificates at a legislative price?

It has been held, time and time again, that the Legislature has the power to determine, within the constitutional limits, the rate of taxation, and under the guise of taxation frequently Legislatures have attempted to confiscate property and business and this has been held invalid, the courts saying that although public utility is an unruly horse, yet he must be well bridled and well harnessed; that they will not allow a Legislature under the guise of taxation to work confiscation.

The power to regulate public utility corporations, is not the power to destroy public utility corporations. The power to regulate presupposes the continued existence of the thing regulated. The power to destroy presupposes its immediate death. The constitutional power to tax presupposes the continued existence of the thing taxed. The power to destroy or confiscate presupposes its immediate death.

A franchise is an entity, as has been well said. There are two kinds of franchises, and it is necessary to have a clear understanding of each in order to be able to distinguish between the two and see why one is alienable and the other is not. There is a primary franchise and a secondary franchise. The primary franchise is the right of being or existing as a corporation. It is a right granted by the Legislature to act as a natural person without incurring liability. The secondary franchise is the right to contract, operate and maintain a corporation. The one is the right to be a corporation; the other is the right to carry on and operate the corporation. The second cannot exist until the first has been vested in the incorporators. This cannot be alienated by the corporation itself. It is a personal trust. Jones on Telegraph and Telephone, pages 49 and 50.

The primary franchise is the personal trust reposed in the corporation by the State to carry on and perform functions necessary to public existence. The grant of these powers to a public utility corporation already in existence is a contract between it and the State and a contract involving the wants and the desires of the absolute needs of the public, of the State and of the nation. If it is a personal trust the Legislature cannot bargain away these rights to any consolidated company on account of the very reasons which brought this corporation into existence, the needs and desires of the public.

It has always been held that the police power is an inalienable attribute of sovereignty and cannot be diminished; that no Legislature can surrender or sell it or destroy or hinder power of its successors to make such enactments as they may deem proper in matters of public policy.

From this it follows that if an irrevocable grant of franchise or any contract made by the Legislature with an individual or corporation, specifies or implies a relinquishment of the police power of the State, it is to that extent invalid, the Legislature having exceeded the authority delegated to it by the people.

In other words, the exercise by the State, at any time, of its right to legislate for the protection and good government of the community can never be construed into a violation of the prohibition in question, notwithstanding what its effects may be to repeal existing charters or otherwise invade the terms of legislative management. Black on Constitutional Law, Second Edition, page 337; Stone vs. Mississippi, 101 U. S.; Boyd vs. Alabama, 94, U. S., 645; 111 U. S., 746; Kresserm vs. Lyman, 74 Fed., 765.

Even the police power, as plenary and comprehensive as it is in the definitions furnished by a vast number of Supreme Court decisions, cannot be used by the Legislature without hindrance. The Legislature itself cannot under the guise of police regulation enact laws which violate the organic law. The police power itself does not embrace the general field of legislation, but is restricted to matters which are properly of police regulation. When in the discussion of constitutional questions, its meaning is limited to making the laws which are necessary for the preservation of the State itself, for the public health, the public morals and the protection of the State.

This paper may be summarized as follows:

First, voluntary consolidation can only be with constitutional or legislative consent, and that only when expressly given, or arising by necessary implication from powers already conferred.

If by legislative enactment after the corporation has come into existence it must be expressly or clearly understood from the powers granted, and the right must be executed or the grant of power may be withdrawn.

There is no reverse power extended to telephone companies in this State in their charters. There is no statute of voluntary consolidation in this State. The act commonly known as the telephone act does not comprehend the act of consolidation.

Involuntary consolidation is, first, opposed to public policy and unconstitutional under our present State constitution.

It is also in direct conflict with the public policy of the Federal Government as expressed both in statutory and organic law.

It is the taking of property without due process of law and a denial of the equal protection of the laws. It means State socialism and the elimination of private property, and this is invalid so long as the private property clause is in our National constitution.

The State has no more right to carry on a monopoly itself of this character than it has to create one. That it cannot wipe out competition and create a monopoly to the detriment of the public is well established.

Involuntary consolidation means absolute confiscation, and confiscation is unconstitutional, except in times of war.

Home Co., at Brockton, Loses Franchise Extension

At a meeting of the Board of Aldermen of Brockton, Mass., a petition from the Home Automatic Telephone Company for an extension of their franchise for one year was refused by a vote of four to one. The two years granted the company to install and operate its system expires Aug. 18, when a $5,000 forfeit comes to the city treasury.

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Additional Comments of Railway Telegraph Superintendents Regarding Telephone Train Despatching

Letters from various railway telegraph superintendents giving their views on telephone train dispatching, were published in our issue of June 27. Among additional comments, Mr. S. L. Van Akin, Jr., assistant superintendent of telegraph of the New York Central lines, writes the following interesting letter on this subject:

Without any reference to the question of labor organizations in the telegraph field, we have found that the telephone is superior to the telegraph—especially in congested districts. After dispatching trains by telephone nearly nine months, we are satisfied that the universal adoption of telephone train dispatching is only a question of time. The expense which must be incurred in connection with putting up suitable wires and office installations may cause some delay. The merits of telephone train dispatching, I believe, are recognized by all wide-awake railroad men.

Another superintendent says:

"I can see no reason why trains may not be safely dispatched by the use of the telephone. The chief obstacle, particularly at this time, is the question of expense. It goes without saying that telephone lines which are to be used for handling trains should consist of metallic copper circuits, and should be constructed and maintained in first-class shape. There should also be reserve circuits to fall back on when one circuit gets in trouble, as it is bound to do. This costs money.

"One great advantage which would result from substituting telephone lines for telegraph lines is the enlargement of the field from which to draw dispatchers and operators, rendering it unnecessary to depend solely on skilled telegraphers."

A very conservative comment is as follows:

"Several of the railroad companies throughout the country are using the telephone exclusively on certain branches or divisions and it is my intention to keep closely in touch with the results.

"The telephone is being used very extensively by the railroad companies throughout the country, and in numerous instances has superseded the telegraph. I believe that its use for railroad purposes will become still more general as time goes on, naturally making inroads on the telegraph unless the development of printing telegraph systems should render the telegraph more flexible, in which event it would have certain advantages."

An interesting communication from a southern railway is as follows:

"There is, undoubtedly, great enthusiasm on the part of those who have experimented along the lines indicated, and it has been noted with surprise that the superiority of telephonic over telegraphic communication with respect to train movements has been demonstrated in so many important particulars; and that what once appeared to be extravagent claims in favor of the telephone bid fair to receive early vindication.

"The writer has not had an oportunity to make extended experiments, or even to observe at close range the experiments now being made on busy sections of railroad, but, in the face of some opposition, he has succeeded in introducing the telephone on a branch line, and has had the satisfaction of hearing the general superintendent tell the general manager that the service on that branch beats everything else on his division.

"A successful signaling system where a great many offices are included in one circuit, and the demonstration of the safety features in telephone train dispatching are two points which, as far as the writer is aware, have not been quite satisfactorily developed."

A western superintendent writes us:

"I have read the editorial in your issue of April 18 very carefully, and concur fully with the expressions contained therein. Ever since the advent of the composite instruments for use by trainmen in securing relief at blind sidings, and owing to the fact that we have transmitted orders to train employees by telegraphone with perfect success, I have always felt that it was only a question of a short while before the telephone would play an extremely important part in the handling of trains, and especially on congested sections of various roads. This is due to the fact that very much more information can be imparted and secured in a given length of time by trainmen, as well as station employees, through the telephone than by the telegraph. The average number of words per minute handled by a train dispatcher by telegraph, with any station, is not in excess of 40 or 45; whereas, in a telephone conversation, and particularly where it is not necessary to make a written record of the orders, from 80 to 115 words per minute can be easily transmitted."

Another from the West:

"This subject has not received much attention in the West as yet, but due to the conditions, principally increased traffic and shortage of operators, the telephone will probably receive more consideration in connection with the train dispatching service than it hitherto has. Personally I see no reason why it cannot be successfully used for this purpose. Aside from the natural prejudices of train dispatchers, there would seem to be no obstacle in the way. Granted that the use of the telephone is absolutely as safe as the telegraph, it would seem that everybody familiar with the operation of a telephone circuit can see that greater facilities are afforded and valuable time saved."

A brief opinion on the question is as follows:

"Up to the present time we have done very little in the way of dispatching trains by telephone, although we have some composite telephones in service on our lines which are frequently used by train crews in getting orders at non-telegraph stations. We have never had any trouble with them so far, and are very much pleased with the arrangement. I am firmly of the opinion that the time is coming when the telephone will be used much more for handling of trains than it has been in the past."

An exceptionally long and interesting letter states that, in the writer's opinion, "the time is not far distant when a large part of train dispatching will be done by telephone; the prejudice against this method of handling trains, even now, is being gradually modified, and the outcome of the experiments now being conducted by the various railroads will entirely remove all antagonism to this means of communication and result in telemore for the handling of trains than it has been in the past."

"With properly constructed lines, train orders and messages can be handled by telephone with the same ease and every bit as much safety as by telegraph. I do not expect this opinion to be unanimously held now, but I believe I have some good company with me who believe it.

"The antipathy of the railroad managements to the telephone when used for train dispatching has blinded them to the flexibility of this means of communication over the telegraph.

"I have in mind the future train dispatchers' circuit equipped with telephones, instruments being located at offices where operators are stationed; and blind sidings equipped with either outdoor boxes to contain the telephone apparatus, or a small booth, similar to those used by interurban lines, for use by trainmen or others in case of an emergency. In addition to this, section houses and floating gangs can be added to the circuits to good advantage. The dispatcher on such a circuit has certainly more advantages at his command to perform the complex duties of his office than under the telegraph system.

"The aid of section men is frequently desired at night and, as many of these houses are not located at stations, the only means of reaching them under the present system is by train, not many being accessible by commercial telephone."

Long Distance Telephone Saves Life.

In the *Central Union News* is reported an incident which shows the great value of the telephone in cases of emergency.

Recently E. B. Collins, a cook, stepped into a telephone booth at Dayton, Ohio, and calling up his wife in Piqua said that he was out of work and despondent and would end his life. He bade her good-bye and hung up the receiver. Mrs. Collins instantly put in a call for the Dayton police and asked them to have her husband followed. They hurried to Collins' room, broke in the door and found him unconscious from the use of chloroform. He was speedily restored.

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Protecting Wires of an Unenfranchised Company

I have operated a telephone exchange in this Missouri town about seven years, built from nothing to a 250-telephone exchange, with nearly 100 miles of toll and party lines out of town. The town board has persistently refused to give me a franchise of any kind, but the Mayor and two or three members of the board have approved of the location of the poles on principal streets.

I staked the plans and they looked over the line of stakes and approved it. Now they grant a franchise to a lighting company and still will not grant one to me, with a plant worth $10,000. I want to know how I may protect my exchange from lighting current. Is there any law as to the distance they may build and run their wires from my lines, or will I have to move any lead that they decide to build under? I have 30 and 35 foot poles on main lines and they are going to slop up a job with native post oaks. Can I make them clear my wires, or can they build right in among them as they claim they can, and I have to get off the earth?

The fact that you have no franchise does not give the electric light company or anybody else the right to destroy your property by building among your telephone wires with a high-current electric wire. Your rights can be protected by injunction.

There is no definite distance set by law that must intervene between your wires and theirs, but the company that erects its lines after another line is established, must keep away such a distance as will protect the former company from interference and injury.

You are undoubtedly aware that the state law gives you authority to set your poles along, across or over the public roads, streets and waters of the state, but not so as to incommode the public in their use thereof. In cities the consent of the authorities must first be obtained. Rev. St. 1899, Sec. 1251. Whether your "town" is a city under this law, we do not know, but, if not, you do not need a franchise. If it is a city, you may compel the Mayor and Board of Aldermen by mandamus to make a designation of the streets where your poles, etc., are to be located under section 1260 of the Revised Statutes of 1899, which provides that the Board of Aldermen or Common Council may by ordinance or otherwise specify where posts, piers, etc., shall be located, the kind of poles, height of wires and may alter such determination after notice.

Compelling Compliance with Franchise

A telephone company having a franchise for one alley and part of one street in a town in Indiana has erected poles on private property and extended its wires across other streets and alleys. Can it be compelled to take wires from across the streets? If so, what would be the mode of procedure?

The company can be compelled to take wires from across the streets. The mode of procedure would be an injunction restraining them from taking them from elsewhere.

Telephone Conduits Not Taxed as Real Estate

The city of Portland, Maine, brought suit against the New England Telephone & Telegraph Company to recover the sum of $1,484, assessed on the conduits of the company as real estate, in addition to an excise tax assessed upon the company by the State. The conduits in question were laid in the streets of Portland under the authority of Section 1, Chapter 204, page 313, Priv. and Sp. Laws, 1891, by virtue of a license therefor granted by the municipal officers according to regulations established by them. Under these regulations, the location of the conduits, wherever made, was subject to revocation and change at the order of the municipal officers. The conduits were not permanently annexed to the soil, nor were they laid for the benefit of the freehold. It was provided by Rev. St. C. 8, Sec. 41, that the excise tax levied upon the company should be in lieu of all taxes upon its property used in the conduct of its telephone and telegraph business, including the poles, wires, insulators, etc. But the statute contained no specification of the conduits of the company among the items of personal property thus exempted. The method of conveying telephone wires by subterranean conduits, instead of poles, had not been adopted at the time of the passage of the original act of 1883, providing for the taxation of telephone companies. The company contended that the conduits were not real estate, and could not be taxed as such by the city. The court upheld this contention, and hence entered judgment for the telephone company. In reaching this decision the court said that the intention with which an article is annexed to the freehold, or the soil, has come to be recognized as a cardinal rule and most important criterion by which to determine its character as a fixture. It was further held that there was nothing in the nature of the conduits, the mode and purpose of their annexation, or the relation of the parties to each other to warrant the inference that the company intended to relinquish its ownership in the pipes, or that the owners of the soil expected to acquire title to them by annexation. Being laid under a license revocable at the will of the municipal officers, so far as any particular highway or location was concerned, they did not become a constituent part of the freehold.

The court also decided that it was the purpose of the Legislature to impose upon telephone companies an excise tax for the privilege of doing business in the State, and to exempt all personal property used in its business, leaving only its real estate, such as land and buildings, for local taxation.

City of Portland vs. New England Tel. & Telg. Co., 68 Atl., 1040.

Telephone Conversations Recognized in the Courts

Courts will take judicial notice of the nature, operation and ordinary uses of a telephone as facts of general scientific knowledge.

This principle was laid down by the Supreme Court of Alabama in discussing the admissibility of evidence of a conversation over the telephone by a witness who did not know who the person was with whom he was talking. The court further quoted:

"When a person places himself in connection with a telephone system through an instrument in his office, he thereby invites communication, in relation to his business, through that channel. Conversations so held are admissible in evidence, as personal interviews by a customer with an unknown clerk in charge of an ordinary shop would be in relation to the business there carried on. And the fact that the person or voice of the person at the telephone was not identified does not render the conversation inadmissible. This ruling is intended to determine merely the admissibility of such conversations in such circumstances, but not the effect of such evidence after its admission."

Western Union Tel. Co., vs. Rowell, 45 S., 73.

Finding of Labor Conspiracy

Oliver T. Crane, master-in-chancery, has filed his reports on the testimony in the cases where several labor organizations of Butte, Mont., and the State were defendants in suits for permanent injunctions brought by the Rocky Mountain Bell Telephone Company. The master finds against the defendants, stating that an attempt to conspire against and ruin the business of the telephone company was made and was partially successful and that threats to continue to do so are still uttered. Exceptions to both reports were filed by the attorneys for the defense.

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Increased Rates Recommended for Indianapolis Independent Companies

The joint committee of business men and city officials in Indianapolis has, in a voluminous report, recommended granting a new franchise, carrying an increase in rates, to the New and Indianapolis telephone companies. The report of the committee is in part based upon reports of expert telephone engineers, and of financial experts, who have investigated the affairs of the telephone companies.

In the report of the joint committee, reference is made to the charter of the Central Union (Bell) Company which permits that organization to charge whatever rates it pleases. Consequently, the only check upon its service and rates is that furnished by competition. Relief for the Independent companies is required because their plant and financial affairs are in such condition that if they were not permitted to raise their rates they would soon cease to be an actual competitor. A belief in the need of such competition is based upon the experience of unsatisfactory conditions when there was but one company.

The committee suggested that the proposed franchise be amended to provide that the New and Indianapolis telephone companies should expend practically at once $500,000 for the improvement of their plants. It is suggested a deposit of $100,000 be made as a guarantee of good faith. Another suggestion concerning franchise amendments is that they should provide for connection with the lines of the Bell telephone company as well as with all other telephone companies' lines outside the city of Indianapolis.

With regard to rates it is recommended that an advance to a figure above the present charges, but below those in the proposed franchise as it stands at the present time, be granted. A sliding scale provision would permit the company to charge, when it has 15,000 telephones, an additional $2 per year for each business telephone, and $1 for each residence telephone, with the privilege of increasing rates beyond this, by $2 and $1 per annum for the respective services, for each additional thousand lines connected until 25,000 lines have been obtained. It is further recommended that a new section be added to the proposed franchise to provide for subsequent adjustment of rates for the benefit of subscribers whereby they may have the benefit of such improvements and inventions which may tend to reduce the cost of service, and that a full financial statement shall be submitted annually to the Board of Public Works, and that the city shall in addition have the right to annually examine the books and physical properties of the company. In addition to this right of examination, to make it efficient as a means of protecting the public, it is suggested that the franchise should contain an amendment enabling the Board of Public Works, after three years, to reduce the rates to a figure which would keep the net profits down to 6 per cent. Provision for depreciation occupies a prominent place in the report of the experts, and the joint committee recommended the insertion of a clause in the franchise to provide that the telephone companies shall set aside annually the sum of $6.50 per telephone for a fund to be used exclusively for the replacement of equipment.

The subject of consolidation of competing plants is briefly treated in the report, on account of an offer submitted by the Central Union Company. It is recommended that for a period of four months from the date of the granting of a new franchise affairs be left in such condition that negotiations on this point may be conducted.

A minority report was filed by Frank S. Fishback, a member of the committee. He seems to be opposed to the granting of an increase in rates upon any grounds. Owing to Mr. Fishback's political aspirations it is locally believed that the character of his report was expected to win for him public support in his campaign for election to office.

REPORT OF TELEPHONE ENGINEERS.

In the technical report made by W. H. Crumb and Geo. M. Brill, telephone experts engaged by the joint committee, the influence of the rates charged on the physical condition of the plant and in producing the present financial conditions is traced. It was found that the records and books of the New and Indianapolis telephone companies have not been kept in such a way as to show what are equitable rates for the different classes of service furnished, a fault which seems to be common to all companies, both Bell and Independent. From the information available the experts deemed it impossible to suggest a schedule of rates which they could demonstrate to be fair to the telephone users. Their study was confined to the problem as a whole, and they sought to determine whether the total income of the Indianapolis Telephone Company had been sufficient in the past to render good service and pay a reasonable return upon the actual investment. The proposed rates were considered from the viewpoint of their ability to provide for giving good service, and the possibility of leaving an excess over a reasonable return upon actual investment.

The history of the New Company is briefly traced, and the belief expressed that in its early years of operation the organization of the New Company had almost no experience, and no reliable information available to assist them in the determination of equitable rates. Knowledge as to the development of the service which they undertook to furnish, as well as concerning the cost of producing such service, they did not possess. Yet they were called upon to meet a condition resulting from the remarkable development of the telephone business which began shortly after their company was organized, and introducing new expense factors making the financial problem complicated and difficult.

The lease of the property of the New Telephone Company to the Indianapolis Telephone Company, made April 1, 1904, was, in the opinion of the experts made in good faith, for the sole purpose of enabling the parties to provide additional funds, adjust the affairs of the company and meet additional demands for extensions and improvements. Later developments have shown that at the time this lease was made it would have been better for the companies to have gone before the Board of Public Works, request an investigation and move for a change in their contract with the city. With respect to the expenditures of capital, it is stated that, while it is a recognized principle that in the formation of large corporations some securities will be necessarily and legitimately used for other purposes than the production of material and tangible assets, there should be a limit to such use, and it is very evident that this limit was exceeded by the New Telephone Company. It is further stated that since the lease of the properties to the Indianapolis Telephone Company the capital has been materially increased and the amount of money spent upon the property has not been commensurate with the securities issued. Sufficient money has not been spent upon the plant for its proper extension and maintenance. At the present time the physical system is being worked practically up to its capacity, and it must receive a large amount of attention to provide for the natural growth of the future. The results show no extravagances either in the salary list or in operating expenses. The failure to properly provide for maintenance and depreciation is laid entirely to the fact that the gross returns were inadequate to take care of these items and pay the necessary operating expenses and the interest on the bond indebtedness, and that this would have been true even though no dividend had been paid on the stock.

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Although no appraisal was made by the experts, they made a rough estimate which caused them to state that a fair first cost of the plant would be $1,200,000; the present value of the plant, in the condition due to inadequate expenditures for maintenance, is set at approximately $800,000. The estimates for necessary renewals and extensions call for an expenditure of $400,000 to cover the items of enlarging the main exchange, installing a new main exchange switchboard, extending conduits, providing additional underground cable, and generally overhauling the system; an additional $100,000 would be required to provide for new facilities to meet the demand for service likely to be felt during the next year. The expenditure of this amount should provide facilities for approximately 14,000 subscribers' stations.

On the basis of a resulting plant value of $1,300,000 after the expenditures suggested, the following annual expenses are computed: operating, $112,000; maintenance and repairs, $140,000; reserve for renewals and depreciation, $91,000. An allowance of interest at the rate of 6 per cent on the estimated plant value brings the annual charges up to $420,000 per year as a minimum amount which the earnings should provide. To provide this income on a basis of 14,000 telephones in service, the number for which the estimated expenditures would provide facilities, the average rate per telephone for all classes of service would have to be $30.07.

The experts state their opinion that rates should not be established for a greater period than five years. The result of the investigation led to the conclusion that it will be impossible for the Indianapolis Telephone Company to furnish satisfactory service and properly develop the field at the present rates charged.

REPORT OF EXPERT ACCOUNTANTS.

A financial report, after an examination of all the books and accounts of the New Telephone Company from the time of incorporation 1898 to March 31, 1904 and of the Indianapolis Telephone Company from April 1, 1904 to March 31, 1908 was made by the Audit Company, of New York. The result of this investigation is summarized in a set of tables showing the income account, assets and liabilities on March 31, 1908, and all stocks, bonds and unclipped coupons issued and their disposition to March 31, 1908. Attention is drawn to the unreliability of the results for the New Telephone Company as an evidence of earning capacity, owing to the lack of depreciation charges included in operating expenses and the merely nominal sum charged for maintenance expenses. In four of the years the maintenance approximated $5 per line telephone while in one year it but slightly exceeded $7 per line telephone and there were no charges for depreciation. In other words the plant was then new and the amount of annual expenditure for repairs and replacements was only nominal, while the necessity of making provision for the future by establishing a reserve was ignored. The first year of operation by the Indianapolis Telephone Company shows no provision for depreciation, and maintenance charges for this and succeeding years were: 1905, $7; 1096, $8.50; 1907, slightly over $8, and 1908, $3.70. The depreciation charges in the last three years were at the rate of: 1906, $6.80; 1907, $6.40; 1908, $11, giving combined charges for maintenance and depreciation at: 1906, $15,30; 1907, $14.60, and 1908, $14.70. The accountants refrained from expressing any opinion as to what would be a normal charge for maintenance and depreciation, as it involved an engineering question, but stated that in their experience with other companies they have not found the charge for maintenance and depreciation per line telephone as high as $14 or below $10.

Analysis of the figures for the past three years was made in some detail. The general trend of the report is to show conclusively that the company is unable to pay interest or necessary fixed charges for maintenance and operation of its plant at the present rates and properly extend its system.

CONSOLIDATION PLAN PROPOSED BY CENTRAL UNION COMPANY.

In a letter to the joint telephone committee, President L. G. Richardson, of the Central Union Telephone Company, made a proposition suggesting terms under which the Central Union company would arrange for consolidation of the two systems operating in Indianapolis. The essential provisions which would be embodied in an ordinance providing for such a consolidation, as submitted by the Central Union company, providing that the company shall acquire the property of its competitor, and that the franchise ordinance of the Independent companies shall be repealed, are: Regulation of rates and such other matters as are properly within municipal authority, and for the public good; that the telephone company shall maintain its plant and service at the highest practical efficiency, methods for enforcing this provision to be provided in the contract; the question of rate revision to be taken up from time to time, but no increase to be granted which will permit net earnings in excess of 10 per cent upon the investment in Indianapolis; a provision for insuring universal toll connection.

Under the various plans proposed for working out this latter arrangement, the Central Union company would secure connection with subscribers to all the Independent plants in Indiana which at the present time have an agreement with the New Long Distance Company.

It is stated on good authority that there is now every prospect that the new franchise will be granted in a form giving substantial relief to the Independent telephone companies, and that there will be no agreement for connection with the Bell company, so that competition will be actively maintained in the city of Indianapolis.

Practical Questions and Answers*

Semi-Dry Battery (1034)*

What is "semi-dry" battery? I have heard of a battery which is used like dry battery, but is claimed not to deteriorate on the shelf before putting it into service. I would like any information you can give about how it works.

The battery to which you refer is doubtless a form of dry cell which is made with all the chemicals in place, but in the dry form. This being the case, there will be exceedingly little action of the sal ammoniac on the zinc, as most salts require to be at least moist or in solution before they will work. The carbon is hollow, with a cork at the top. To put the cell into service the cork is removed and the cell filled with rain water. After a little time it will be absorbed and the cell again filled with water. This is to be done till no more water is absorbed. Then the remaining water is thrown out, the hole plugged up and the cell is ready for use.

*Replies to queries designated by an asterisk (*) are furnished by Arthur Bessey Smith, Asst. Prof. of Telephone Engineering, Purdue University.

Extending Desk Set Cord (1035)*

What is a good, neat way to make a desk set cord longer? The kind of desk set which we use has a 3-strand cord from the bell box. The bell box contains the bell, condenser, induction coil, and a row of binding posts. In some installations it is necessary to place the bell box in such a position that the six-foot cord is hardly long enough. We have tried splicing on rubber-covered wires and taping the joints, but it does not look good. Can you suggest a better way?

If you have sufficient call for such long cords it would be well to order some longer cords made to your special length, and keep them in reserve for that purpose only. The cost will be very moderate and the resulting neatness is worth the cost. But if you do not care to have special cords made, you can

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often get around the difficulty neatly by putting in a small terminal block. Make or buy a block with three binding posts on it. Locate this on the desk or table where the cord from the stand can reach it. Being small, no difficulty ought to be experienced in finding a place for it. Run rubber covered house wire from this block to the bell box, which may be any distance away.

Dimensions of Ringer Coils (1036)

Will you kindly explain without using algebraic formulæ, but in plain words that an average electrical worker can understand, the relation of length of core to winding in high resistance bell coils? What effect, if any, and why, would it have if I were to wind 1600 ohm ringers on cores double the length of the cores in use at present? What is the electrical effect on ringing and talking currents?

In Fig. 1 is shown a cross-section of an electromagnet, such as a ringer spool with two dimensions indicated. Of these, *H* represents the height of the winding space measured from the core to the outside of the spool heads, and *L* represents the length of the winding space between the heads. The product of these two dimensions, *H* and *L*, both expressed in inches,

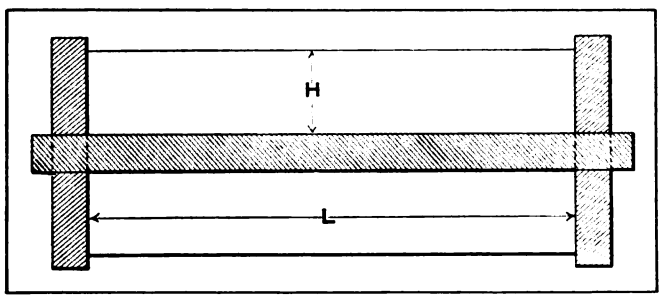

Fig. 1.—Outline of Ringer Coil.

will give the number of square inches of winding space on the spool, which product determines the number of turns of wire of any given size which can be wound thereon. If these results, expressed in square inches, be multiplied by the average length of one turn of wire on the spool, the volume of winding in cubic inches can be ascertained. The value thus found will determine the amount of wire, and, consequently the resistance of the wire of a given size which can be put on the spool.

It is clear that if the length of the winding space be doubled, the cross-section area of the windings and also the space occupied by windings will be doubled.

With the values corresponding to the dimension lines on the sketch ascertained, the resistance of the winding, and the number of turns of which it will be composed, can be obtained from Table *A*, which is approximately correct, if the wire is wound evenly in layers and the insulation is composed of single silk wrapping such as is generally used for this purpose. Therefore, referring to Table *A*, if the ringer spools are lengthened, it will be seen that, if rewound with wire of larger size, keeping the resistance equally as great as in the shorter windings, the turns will necesarily be more numerous; and other things being equal, the effectiveness of the ringer will be in proportion to the increase. The mechanical structure, however, will not be so well proportioned, and will be liable to detract from the otherwise increased efficiency.

Size Wire, B. & S.	Turns Per Sq. In.	Ohms per Cu. In.
30	5,950	63
31	7,164	96
32	8,597	145
33	10,332	218
34	12,570	343
35	14,328	489
36	16,940	721
37	19,770	1,062
38	22,820	1,557
39	26,700	2,266
40	31,560	3,400

Table A, From Which the Number of Turns and Total Resistance of Winding For a Coil of Given Dimensions May be Computed.

Considering, however, only the electrical and mechanical properties, we could, with the longer ringers properly wound, expect to be able to ring more bells on a bridging line, and have the talking qualities of the line equally as good, if not better than before.

Specific Gravity and Its Variation. (1037)*

In visiting a telephone exchange recently the engineer showed me his storage battery curves of charge and discharge. He called them "specific gravity tests." They were drawn to cover the daily variation for a week. Is this a more accurate test than the voltmeter or cadmium tests? Also what effect does the temperature have on the specific gravity?

The truest gage for the performance of storage battery is not voltage, output, specific gravity nor the cadmium tests, but the careful watching of all the symptoms. The main reliance of the good storage battery attendant is placed on the variation of specific gravity, the behavior of the voltage while charging and discharging, the gassing or bubbling, and the appearance of the plates. The older methods relied largely on voltage, but modern engineering calls for an intelligent watch of all the signs, among which specific gravity is very important.

A rise in temperature causes the specific gravity to fall, and the ratio is nearly inverse numerical. It has been customary for many people to take 3 deg. Fahr. for every point of gravity, but this is not quite correct. The following table from "Storage Battery Engineering," by Lyndon, gives the changes more nearly:

Eighty degrees	1.190	1.1815	1.210	1.201
Fifty degrees	1.1985	1.190	1.219	1.210

That is, if an electrolyte at 80 deg. has a specific gravity of 1.190 it will rise to 1.1985 if the temperature falls to 50 deg. This makes 3.53 deg. per point change. By the term "point" is meant a thousandth of the unit of gravity. Thus, 1,210 spoken of as "twelve hundred and ten" and one "point" is .001. For acid having a greater density, as in the last two columns, the rate is 3 1/3 deg. per point.

In making up records and drawing curves for the purpose of comparison the gravity is often corrected to 68 deg. as a standard.

Telephone Finances

Telephone Revenues and Expenses in South Africa

The gross telephone revenue in Cape Colony, South Africa, for 1907 was $222,830, an increase of $3,577 over 1906. The gross annual rentals amounted to $210,549, and the call office fees to $5,670, being increases respectively of $4,512 and $574 on the preceding year. Working expenses amounted to $162,395, a reduction of $13,339 on the previous year's figures, mainly due to the postponement of all but immediately necessary maintenance works. Interest and depreciation charges were considerably increased, consequent on additional capital expenditure incurred, the result being a net loss of $15,548 on the year's working, as compared with a loss of $24,766 in 1906.

Kansas City Independent Finances

Very considerable increases in earnings characterize the operations of both the Home and Long Distance companies of Kansas City, Mo., for the year 1907-1908, as shown in the report for the fiscal year ending March 31, just mailed to stockholders. No less an increase than $68,032.75 for the year was made in the

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combined net earnings of both companies. The total surplus earnings of the two companies for the year ending in 1908 amount to 10 9/10 per cent on the outstanding stock of the Kansas City Home Telephone Company.

The following figures give a basis of comparison for the past four years:

THE KANSAS CITY HOME TELEPHONE COMPANY.

	March 31, 1905.	March 31, 1906.	March 31, 1907.	March 31, 1908.
Gross earnings	$406,016.54	$527,659.46	$658,897.42	$766,945.93
Expenses	230,349.22	280,169,14	361,460.29	412,970.94
Net earnings	$175,667.32	$247,490.32	$297,437.13	$353,974.99
Interest	126,191.34	125,819.77	140,168.59	150,101.56
Surplus	$49,475.98	$121,670.55	$157,268.54	$203,873.43

KANSAS CITY LONG DISTANCE TELEPHONE COMPANY.

	March 31, 1905.	March 31, 1906.	March 31, 1907.	March 31, 1908.
Gross earnings	$25,730.41	$67,849.49	$133,976.65	$188,266.55
Expenses	9,745.30	21,443.54	54,250.41	79,340.06
Net earnings	$15,985.11	$46,405.95	$79,726.24	$108,926.49
Interest	18,935.00	30,000.00	46,110.54	53,882.93
Surplus	*$2,949.89	$16,405.95	$33,615.70	$55,043.56

*Deficit.

A statement of the number of telephones in service in the Home system, the average earnings, expenses and surplus per telephone for the past four years is given as follows:

	March 31, 1905.	March 31, 1906.	March 31, 1907.	March 31, 1908.
Number of telephones	11,389	14,831	18,561	30,146
Gross earn's per telephone	$42.05	$40.72	$38.54	$39.07
Expenses per telephone	23.86	21,62	21.14	21.04
Net earnings	$18,19	$19.10	$17.40	$18.03
Interest per telephone	13.07	9.71	8.20	7.64
Surplus	$5.12	$9.39	$9.20	$10.39

During the year 1905 the average gross earnings per telephone were larger than in the succeeding years, owing to the fact that the number of business telephones at a higher rate was much greater than the number of residence telephones, and as the amount of residence service at a lower rate increased, the average necessarily decreased.

Since the organization of the Kansas City Home company the sum of $363,186.25 has been paid to the stockholders in dividends after all expenses and interest charges have been liquidated.

In connection with the comparative statement of earnings of the Long Distance Telephone Company it is of interest that the earnings are derived from both long distance lines and local operating companies. The company now owns 999 miles of long distance pole lines, 3908 circuit miles of long distance wire, five local exchanges and 5201 telephones. During the last fiscal year this company handled 625,950 long distance messages.

The following statement showing the earnings per unit is of interest:

	Toll line		Exchanges	
	Per mile pole line.	Per circuit mile of wire.	Per toll message.	Per telephone.
Gross earnings	$181.50	$46.40	$0.28 9/10	$14.75
Expenses (including commission and mileage paid on toll lines)	101.68	26.00	0.16 2/10	8.31
Net earnings	$79.82	$20.40	$0.12 7/10	$6.44
Less interests and bad debts.	39.34	10.05	0.06 3/10	3.51
Surplus earnings	$40.48	$10.35	$0.06 4/10	$2.93

The management of these extensive properties is vested in the following boards of officers: Kansas City Home Telephone Company: Joseph J. Heim, president; Henry Koehler, Jr., vice-president; O. C. Snider, vice-president and treasurer; Hugh C. Ward, secretary.

Kansas City Long Distance Telephone Company: O. C. Snider, president, treasurer and general manager; Joseph J. Heim, vice-president; Hugh C. Ward, secretary.

Increased Earnings for Ohio Companies

An increase of over $600 per month over the figures for last year's earnings is the showing made by the Local Telephone Company, at Bellevue, Ohio, which operates exchanges at Norwalk, Chicago, New Washington, Berlin Heights, Wakeman, Greenwich, Monroeville, Plymouth, Milan, New London, Attica, Havana and has 300 miles of toll line. This company is one of a group of companies having headquarters at Bellevue, Ohio, of each of which Mr. Frank A. Knapp is president and general manager.

Quarterly dividends at the following rates were mailed on June 30 for the respective companies:

The Bellevue company, 1½ per cent on preferred stock and 1½ per cent on common; the Local company, 1½ per cent on preferred stock and 1 per cent on common; Crestline Telephone Company, 1½ per cent on preferred stock and 1¼ per cent on common.

Not one of these companies, it is said, has ever missed a dividend, and the greater number of the checks are mailed to stockholders in the section of the country where the companies operate.

Telephone News

Appellate Court Decision in Kellogg Case

The Branch Appellate Court, at Chicago, on June 30, 1908, rendered its decision in the suit of Dunbar et al. vs. American Telephone & Telegraph Company et al. concerning the stock ownership of the Kellogg Switchboard & Supply Company. The court held with Judge Windes, of the Circuit Court, that the material allegations of the bill of complaint were proved, but held that the relief granted should extend only to an injunction against the voting of the stock in question and against its receiving any further dividends on the stock.

The court gave as its opinion that the 1907 stockholders' meeting did not elect directors, because neither Kellogg nor Barton had the right to vote 3307 shares of stock of which the ownership is in dispute. Eliminating these shares of stock, there was not a quorum and, therefore, the election was illegal. Therefore, the decree of Judge Windes in declaring the Kellogg board of directors elected is held to be erroneous. In suggesting relief to which the complainants are entitled the decision says "that the complainants have no stand to insist upon any relief beyond that which is necessary for their own protection against injury. Such protection will be fully met by an injunction against Barton and the American Telephone & Telegraph Company from voting the shares of the Kellogg stock purchased from Milo G. Kellogg and others and from acquiring or attempting to acquire any stock of the Kellogg company and voting it at any stockholders' meeting and from exercising or attempting to exercise any control, direction, supervision or influence over the acts of the Kellogg company; and by enjoining the Kellogg company from permitting the stock to be voted by the American Telephone & Telegraph Company and from paying any dividends to be hereafter declared on account of such stock to the American Telephone & Telegraph Company or to any corporation or person for it. This was the relief given in the United States vs. Northern Securities Company."

Mr. Kellogg since the decision has said that "The decision is so inadequate in the relief given, on any theory of the case, that it does not seem that it can for a moment stand in the Supreme Court in October. It seems evident that the real purpose and intent of the decision of the Branch Appellate Court

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was only to render such a decision in the case as would leave the management of the company *in statu quo* for the comparatively short period before the court of final resort could determine the exact relief to which the complainants were entitled. As the Supreme Court has already held, when the case was before it on demurrer, that if the allegations of the bill were true the purpose of the stock was an absolute nullity and no title to the stock passed from the original owners, it seems to be a foregone conclusion that the Supreme Court will decree full relief in accordance therewith and, in effect, that I be reinstated in control of the company. It is my confident expectation that such will be the result."

Obstacle to the New Indianapolis Franchise

A suit has been filed by Prosecutor Hooton in the Marion County Circuit Court supplementing the action filed some time ago, praying for an order restraining the New and the Indianapolis Telephone Companies and their officers from entering into a new franchise contract with the city of Indianapolis providing for an increase of rates. The amended complaint alleges that the New Telephone Company, by the creation of the Indianapolis Telephone Company, and by leasing its plant to it, exceeded and violated its charter rights and has thereby forfeited its claim to life under the State statutes. The complaint asks the court to appoint a receiver for the properties and other relief in the name of the people.

The object of the suit is said to be to forestall or delay the city administration from proceeding with the drafting, signing and ratifying of a new franchise contract until absolute assurances are made that a consolidation with the Central Union Telephone Company will be effected as soon as the franchise is granted.

The civic committee recommended the granting of the franchise and this to be followed by consolidation, if possible. The prosecutor urged on by the opposers of the Indianapolis Telephone Company has taken this step to put a stop to further action if possible, and to force a consolidation which never has had the least possibility of being effected.

The court has adjourned for the summer, and it is probable that no restraining order will be issued. In the meantime the Mayor and board of public works propose to go ahead and submit the new franchise to the City Council for ratification.

Joint Operating Agreement at Richmond, Ind.

Reports from Richmond, Ind., state that an arrangement has been entered into between the Richmond Home Telephone Company and the Central Union Telephone Company whereby joint operation will in some respects be practised.

For about two years the Central Union Telephone Company has been endeavoring to bring about such an agreement, and has repeatedly delayed the reconstruction of its plant pending a final decision.

The requirement by the city that the Central Union company should remove its poles and aerial cables from the main streets by Sept. 1 hastened action, and the result was an agreement whereby it is understood that the Central Union company is allowed to use certain ducts and cables of the Home Telephone Company and vice versa, and whereby the local company secures connection with the Central Union toll lines as well as those of Independent companies. For the present the Central Union will maintain its exchange in Richmond.

Nebraska Railway Commission Rescinds Recent Ruling on Messenger Charges

The railway commission has reconsidered its action ordering telephone companies not to charge a messenger fee when a connection is made on a switchboard and no messenger is actually used. The commission recently ruled that this practice must stop by August 1st. The usual charge for messenger or connecting service is ten cents and in most cases the local sublicensee exchanges receive the fee through the Nebraska Telephone Company. The Phelps County Telephone Company is not to be permitted to increase its rates at Holdredge without a protest. Protests have been received and a request made for a hearing to be held at Holdredge. The railway commission recently announced that it would not pass on the request for permission to increase rates the later part of June.

No Consolidation in Seattle

Reports have recently been published in Seattle, San Francisco and other papers stating that a consolidation was to take place between the Independent Telephone Company, of Seattle, and the Pacific (Bell) Telephone & Telegraph Company in the State of Washington. In an interview with a representative of the AMERICAN TELEPHONE JOURNAL on June 29 at his home in Youngstown, Ohio, President Adams, of the Independent Telephone Company, of Seattle, said:

"There is no merger pending between the Independent Telephone Company, of Seattle, and the Pacific Telephone Company and none is contemplated. You can make this statement as strong as you desire. Nothing is being done along this line, and nothing will be done in the matter. The Independent company is attending to its own affairs."

Legality of Rebates to Stockholders in Wisconsin Mutual Companies

The Jefferson Telephone Company, of Jefferson, Wis., owning and operating lines in Jefferson County, has submitted to the Railroad Commission of Wisconsin (public utilities board) a question that is of vast importance to many so-called farmers' telephone companies in Wisconsin and elsewhere. The question is: "Do rebates in telephone charges to stockholders constitute unlawful discrimination?"

The Jefferson company is capitalized for $6,000. There is now outstanding $4,200. It has about 150 subscribers, of which nearly 70 are stockholders. To stockholders the charge for service per month is $1, and to non-stockholders it is $1.25. Shares have a par value of $50. The regular annual dividend is 6 per cent, or $3 per year. This gives stockholders telephone service at $9 net the year or 75 cents net the month.

The commission is considering the question: Is it discrimination to give stockholders service at 75 cents the month and charge non-stockholders $1.25 the month? The company claims that as the privilege of holding stock is extended to everybody, and thus the privilege is not limited, there is no discrimination.

Meeting of Fifth District of the Michigan Association

The fifth district of the Michigan Independent Telephone Association met at Cadillac last week. The attendance was small.

C. W. Swaverly was elected delegate to the International convention to be held at Chicago, and George F. Stout, Lake City, alternate.

The district committee is composed of one member from each of the counties represented, as follows: Mr. Marshall, of Reed City; Thomas Bromley, Jr., of Hart; W. A. Young, of Benzonia; Charles Wilcox, Traverse City; W. A. Bell, Everett; Oliver M. King, Houghton Lake; C. E. Smith, Cadillac; C. W. Swaverly, Kalkaska; George F. Stout, Lake City; Senator Palmer, of Kalkaska.

The officers elected for the coming year are: C. W. Swaverly, Kalkaska, president; C. E. Smith, Cadillac, secretary.

Supplies to Be Purchased for Alberta Telephone System

Hon. W. H. Cushing, of Calgary, minister of public works for Alberta, was recently in Winnipeg. While he would neither affirm nor deny the statement, it is reported that the trip was taken with a view to purchasing material for the Alberta tele-

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phone system, which the government recently purchased from the Bell company. From the fact that Mr. P. F. Sise and Mr. E. H. McLea, of the Northern Electric & Manufacturing Company, of Montreal, were also in Winnipeg at the same time as Mr. Cushing it was locally assumed that plans were being considered for placing a contract for equipment and supplies with that company.

Telephone Construction in Northern Ohio

In the northern part of Ohio quite a large amount of new work was done last year and this has put the plants in such shape that during this summer little construction will be done. There is little doubt but that the work will be taken up with vigor a few months later, as it is expected that the constantly increasing demand for Independent service will outrun present facilities.

E. G. Miller, general manager of the Warren & Niles Telephone Company, Warren, states that about $5,000 bonds will be sold this year to pay for the reconstruction of two of the cable leads. Just now the company is rebuilding and increasing the line capacity of two of its trunk lines, one of nine miles with two new circuits and one of five miles with four new circuits. In 1907 $4,800 was spent in improvements, 3000 ft. of 150-pair and 4000 ft. of 50-pair cable and 10 miles of open wire being added. The number of jacks in multiple is 1050 and the number of subscribers' lines the same. Thirteen operators' positions have been equipped and there is a surplus capacity on the switchboard for 350 more. Mr. Miller says: "The situation here looks good. Confidence is returning slowly but surely, works are beginning to run with some prospect of regularity and there are other favorable features. During the period of depression we show a net gain."

The Bergholz Telephone Company, of Bergholz, to the northwest of Steubenville, installed an exchange at Malvern last year and built a connecting line between that point and Osnaberg. This construction required 450 poles, 25 ft. and 30 ft. lengths and 7 in. tops, and added a wire mileage of 13 miles. The open wire strung amounted to 19 miles. In all about $3,000 was spent in the work. L. W. Steinmetz is the president of this company, and Robert McLaughlin, manager.

The Painesville Telephone Company, Painesville, has but 15 more lines ready for connection without further equipment. The company now has 960 subscribers' lines connected. Last year some extensions and improvements were made on the exchange lines, including the addition of 30 25-ft. poles and the stringing of 25 miles of open wire. One mile of conduit, measured on the street, has been laid.

The owners of the United States Telephone Company and the Cuyahoga Telephone Company are arranging to make some improvements in the plants of a few of the subsidiary companies in this State. At Zanesville 56,000 ft. of cable will be strung and 1000 new telephones added. A new common battery switchboard will be installed in the plant at Massillon, capable of accommodating 500 more telephones than the present one. In addition 30,000 ft. of cable will be strung.

A new switchboard will also be added to the equipment of the exchange at Fostoria, giving it an additional capacity of 500 telephones. At this place 55,000 ft. of cable will be strung during the summer. The United States company will complete its switch station at Crestline which was partly built last year. The work was commenced early in May. A portion of the 1000 miles of toll line that this company will put in during the year is to be built in the vicinity of Crestline, while the remainder will be installed between Toledo and Monroe, Mich., to connect up the Ohio and Michigan lines.

Independents Threaten to Retaliate

The Indiana Independent telephone companies are aroused over the rumor that a general order has been issued by the American Express Company to discontinue Independent telephone service in the State. They cite the fact that there are 453 Independent telephone companies operating over 200,000 telephones in Indiana, five times the number owned and operated by the allied Bell systems, the service of which the American Express Company was thought to be preparing to use. For this reason the Independents claim such a move would be unjust and unwise discrimination against both the Independent telephone companies and the people. They further state that no small part of the equipment, supplies and material of Independent telephone companies is transported by express, and that there is no law against the Independent telephone companies discriminating against the American Express Company in their patronage in retaliation. It is also fair to presume the large number of people having Independent telephones will likewise deal with express companies readily called over their lines.

Complaints of Rate Discrimination in South Dakota

Complaint has been made by officers of the South Dakota Traveling Men's Association to the Telephone Commission concerning certain cases of discrimination in telephone toll rates. Examples were cited in support of the contention. The complaint was heard at Canton, and in an answer filed by Judge C. B. Kennedy, president of the Independent Telephone Association, acting as its attorney, it was admitted that the discrimination actually existed, but was due to the rules of the toll line operating companies rather than to the strictly local exchanges. In other words, the companies owning toll lines charge one rate to a town where they also own the exchange and charge another rate to a town where the exchange is owned by a local Independent company. It is asserted by the owners of the local Independent companies that they have no part or interest in fixing the rates which the sender of a toll message shall pay, this being done entirely by the toll companies. They asserted that, being simply the agents of the toll line companies, they are powerless to adjust this discrimination, and request that the telephone commission shall fix a maximum rate and do away with the practices leading to the present discriminatory charges.

Telephone Superintendent Discovers Misplaced Highways

Locating telephone lines in British Columbia, Superintendent G. C. Hodge, in charge of the division of the British Columbia Telephone Company, which has its headquarters at Nelson, has discovered several inaccuracies in highway boundaries. His surveyors have found that the highways have in some places encroached a number of feet on private property, making an interesting right-of-way problem for the telephone company. It will not, apparently, be settled until the municipalities decide upon the proper course of action to pursue with respect to the highways.

United States Independent Buys Syracuse Independent at Foreclosure Sale

Reports from Syracuse announce that on July 3 the property of the Independent Telephone Company of Syracuse was bid in by W. Roy McCanne, of Rochester, representing the reorganization committee of the United States Independent Telephone Company. This sale was made in connection with the reorganization plans of the United States Independent Telephone Company.

The clearing up of the situation which will immediately follow, it is understood, will enable the company to expend a considerable sum of money for extensions and improvements.

The Telephone at the Republican National Convention

The telephone was extensively used during the recent Republican national convention in Chicago. A private branch exchange switchboard was installed in the Coliseum in connection with 15 public pay station booths for local or long distance connections. The various committee rooms and delegate headquarters were

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connected through this board. Some of the headquarters requiring extensive long-distance service were connected direct to the main office of the long-distance company.

It is reported that President Roosevelt was a listener to the demonstrations of enthusiasm which greeted the mention of his name in the convention on June 17. It is said that special transmitters were hung in front of the platform and, when the demonstration occurred, were cut in on the special line to the White House in Washington.

Independent Telephone Company Active in Idaho and Washington

The Interstate Telephone Company is planning a long distance line from Spokane, Washington, to Lewiston, Idaho, taking in all of the important towns of the Palouse country along its route. This will open up to the Independents a territory which has been a stronghold for the Pacific Telephone and Telegraph Company.

The Interstate company has just completed a toll line from Spokane to Wallace, Idaho, a distance of 112 miles at a cost of about $65,000. The North Idaho Telephone Company which has a franchise in Wallace, is rushing work upon its exchange. The switchboard will have a capacity of 300 lines. It is expected that service can be given by early August.

An Unusual Lightning Effect

Throught the courtesy of Mr. E. F. Barker, the manager of the Citizens' Home Telephone Company, at Oswego, Kan., we are enabled to print the accompanying two photographs of an interesting case of a building damaged by lightning.

In Fig. 1 is shown a portion of the wall between the arrester

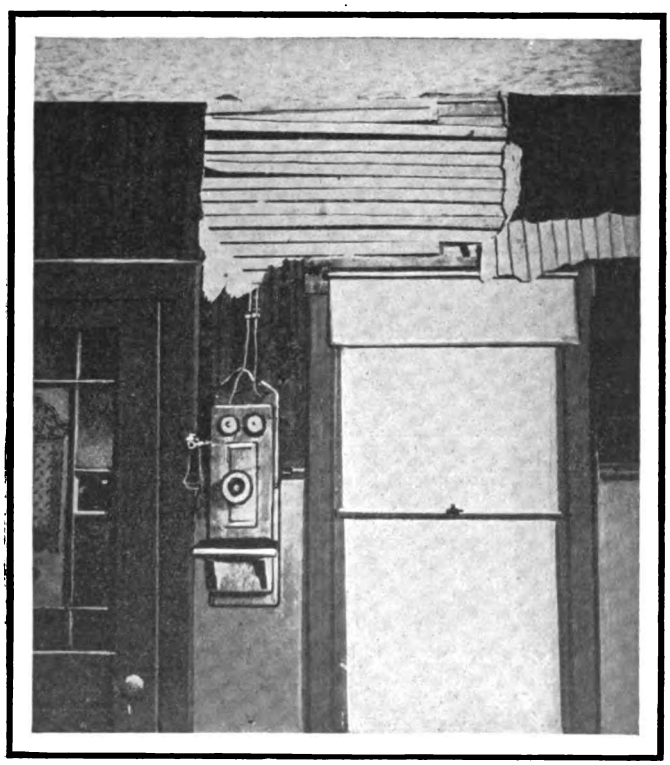
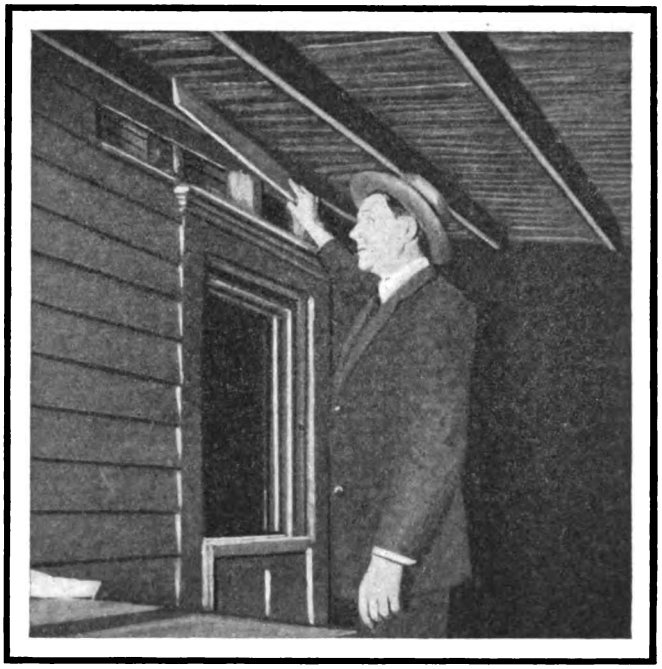


Fig. 1.—Lightning Damage in Interior of House.

and the ceiling, which was badly torn. The second picture shows the appearance of the outside of the building.

It will be seen that the instrument, which was absolutely uninjured, was about the only thing near the lightning arrester which came through without harm. The window on the right was broken, as was also one directly opposite the telephone, at the other end of the room.

The drop wire, which was No. 14, on a common return system, entering the building through a porcelain tube, was entirely consumed from the house to within ten feet of the pole.



Damage Outside House at Point of Entrance of Wires; Wires Were Completely Consumed by the Lightning Stroke.

The direct stroke of lightning came from a tall cottonwood tree, which stood about six feet from the line. Information as to local conditions likely to have been most instrumental in producing this effect is lacking.

Oakland Wireless Telephone Company Debarred from the Use of the Mails

Recently mention was made in these columns of a wireless telephone company in Oakland, Cal., which the United States postal authorities charged with fraudulent use of the mails.

The Post Office Department has now issued a fraud order against this company, which was known as the Oakland Transcontinental Aerial Telephone & Power Company, a concern advertising that it owned an invention by which it was possible to talk all around the world without wires or cables. The promoters were Harry P. Dwyer, Wade H. Shadburne, W. F. Allen, R. W. Bardack, Albert Jannke and Albert C. Rochel. It is charged they were endeavoring to sell stock in the company and that the circulars and advertisements used by the company in its solicitations of subscriptions were copied word for word from a booklet used by a reputable company organized for the purpose of placing on the market a device for limited wireless telephoning.

New Office in Atlanta Goes Into Service

On June 28 the new branch office of the Southern Bell Telephone & Telegraph Company in Atlanta, known as "Ivy," was formally thrown into service. This office is situated in the heart of the business section, just north of the railroad, and was built with the idea of relieving congestion in the present North and Main offices and also to provide additional facilities in the section which it serves.

The opening of this office is considered as a milestone in the progress of telephone work in the South, as the building is one of the finest exclusively telephone buildings south of Washington. It consists at present of a three-story and basement steel skeleton brick structure arranged for two complete

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central offices of 9600-line capacity each; the building will be used by the plant and operating departments only, there being no arrangements for general offices of any kind.

Looking ahead to the continued rapid development of the telephone business of Atlanta the engineers arranged the steel work for an ultimate addition of four more stories, giving the building when finally completed seven stories and a basement.

The present subscribers' switchboard consists of 10 three-position "A" sections and four two-position "B" sections with the necessary complement of desks and service observing equipment. The terminal room is arranged for a second intermediate frame, relay rack, etc., to serve the ultimate second office; the main frame, however, will be common to both offices and will ultimately be about 60 ft. long.

In designing the building particular attention was given to the comfort of the operators; large, airy retiring rooms have been provided, with ample toilet facilities, including a bath room. A kitchen has been arranged so that lunches may be had when the operators prefer to remain in the building.

The transfer of subscribers from two offices into one necessitated many changes in call numbers. Circular letters were sent to all subscribers whose numbers were affected, and by judicious newspaper advertising the telephone company succeeded in effecting the change without much opposition. New directories were prepared and delivered a week ahead of the "throw," the subscribers being notified to begin using the new directory on the 29th and to destroy the old one at the same time. At present this office is serving the greater part of residence stations and retail business stations on the north side of the city.

Additional Users of International Association Stamps

The International Independent Telephone Association has announced the names of the following companies who have agreed to co-operate in assuring revenue for the organization by the use of stamps upon invoices:

Mountain State Electrical Company, Wheeling, W. Va.; Naugle Pole & Tie Company, Chicago, Ill.; Southern Pine Manufacturing Company, Paducah, Ky.; R. Thomas & Sons Company, East Liverpool, Ohio; American Electric Fuse Company, Muskegon, Mich.; Premier Electric Company, Chicago, Ill.

Operating companies which have retained the list published in our issue of May 16 have been requested to add the names of these companies to the third list published in that item.

Work on the Dallas Independent Telephone System to Be Rushed.

It is announced by Cecil L. Simpson, of Dallas, Tex., attorney for the Independent Telephone Company, which was granted a franchise several weeks ago to install a telephone system, that preparations are being made to begin construction work in a few weeks. The plans which the company have adopted call for the expenditure of about $1,500,000 in the construction of its system. The terms of the franchise require that construction work shall be started by Oct. 1, and failure to do this shall cause the forfeiture of $10,000 guaranty money put up by the company at the time it obtained the franchise. It is provided in the franchise that the maximum rate which the company can charge for services is $5 a month for a business office and $3 for a residence.

State of Mississippi Has New Free Service Scheme

It is reported that the Cumberland Telephone & Telegraph Company has made complaints to the Railroad Commission that the State of Mississippi has been tapping its long distance wires and wants to know what recourse there may be. According to General Manager Hume the Cumberland has a toll station at Parchman, which is the railroad station on the state's big convict farm in Sunflower County. On this 14,000-acre farm there are 10 separate and distinct camps, with an average of 75 or 100 convicts to the camp, each camp being under the supervision of a sergeant. The state has connected these several camps with telephone wires, and Mr. Hume states that his agent found each camp was connected with his long distance wires, thus enabling the sergeants on either camp to talk to the general office in the city of Jackson, or elsewhere. He further states that these connections with his system were made without the knowledge or consent of the Cumberland company. As soon as the company discovered that these connections had been made with its wires they were cut.

HANG THIS CARD NEAR YOUR TELEPHONE.

The Wheatley Telephone Co.

THIS NUNBER IS..... ..

TEN TELEPHONE COMMANDMENTS.

1 Thou shalt call by **number only.**

2 Thou shalt always answer thy telephone at the **first** sound of the bell.

3 Thou shalt not use thy telephone when the lightning cracks in the sky, for verily I say thou endangerest thyself and will **not** be answered.

4 When the operator says, "Shake up your transmitter," thou shalt shake, even if it givest thee paralysis.

5 Thou shalt not call again directly after ringing off else the operator deem it a ring-off and not answer.

6 Thou shalt not expect to get a party in another town directly after calling, for the line may be busy or the party not to be found

7 Always shalt thou ring off when through speaking for it will save confusion all around

8 Thou shalt not rave and cuss at the operator if she does not answer on the dot, for she is busy and will attend to thy wants as soon as possible.

9 Never shalt thou flirt with the operator nor force her to converse with thee for it doth impair the service.

10 Above all, never shalt thou get huffy and lose thy temper, but be thou courteous and pleasant voiced, and remember especially that thine is not the only wire in the cable.

DON'T FORGET

To ANSWER your ring promptly.
That ONE TURN of the crank calls "Central."
To RING OFF when through talking.

NEW SUBSCRIBERS are being added daily. Ask the operator for the numbers and write them on reverse side of this card.

Card Distributed by Mr. H. C. Larrabee, Temporarily in Charge of the Exchange, to Telephone Subscribers in Wheatley, Ont., Can.

No Difference in Day and Night Telephone Toll Rate in Virginia

Several months ago the Southern Bell Telephone & Telegraph Company of Virginia raised its night rates for long distance messages to the same rate as that charged for day messages. The State Corporation Commission, upon its attention being called to the matter, issued an order restraining the company from raising the night rates in Virginia. The telephone company then made application for permission to make its day and night rates the same.

The commission has recently handed down a decision granting the telephone company's request. The commission based its decision upon the fact that the service rendered is equally as prompt as in the daytime, while the expense is greater as it is more difficult to locate the party called.

MR. MILTON L. CLAWSON has removed his law offices to suite 714, new Odd Fellows' building, corner Pennsylvania and Washington streets, Indianapolis, Ind.

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A. T. & T. Co.'s Franchise Tax Assessments Reduced in New York State

Justice George H. Fitts, of the Supreme Court, has granted six orders in favor of the American Telephone & Telegraph Company, reducing the franchise tax asessments of the company in six municipalities in eastern and central New York. The orders are directed to the State Board of Tax Commissioners and are practically mandates directing the State board to make the reductions in assessments named in the orders. Justice Fitts directed that the franchise tax assessment of the relator in Syracuse be reduced from $13,200 to $11,616, or to 88 per cent of the original assessment. The reduction in favor of the relator in the city of Albany was from $12,000 to $10,200, or to 85 per cent of the original assessment. In the city of Rensselaer the reduction is from $8,350 to $6,596.50, or 79 per cent of the original assessment fixed by the local authorities and the State Board of Tax Commissioners. In Utica the reduction is from $7,200 to $5,832, or 81 per cent of the original. In Elmira the reduction is from $6,000 to $4,380, or to 73 per cent. In Schenectady Justice Fitts ordered a reduction in the real estate assessment of the relator from $6,900 to $5,037, and in the special franchise assessment from $6,900 to $5,037. In each case of reduction, Justice Fitts directed the local authorities to refund to the American Telephone & Telegraph Company the amount of the excess tax that may have already been paid by the company.

Proposed Bell Regulation in Minneapolis, Minn., Will Be Confiscatory

Changes in the proposed telephone ordinance introduced by Alderman James Dwyer at a meeting of the municipal City Council held early in April would cause the Northwestern Telephone Exchange company to operate at a loss of $29,180.78 for the year 1908. This is the conclusion of J. Gordon Steele & Company, stated in a report to the telephone rate committee of the City Council, by whom the firm was engaged to investigate the books and accounts of the company. The report covers the situation in some detail, and it is understood that copies will later be published in pamphlet form for distribution to persons interested in the matter.

In the Manufacturing Field

Max W. Zabel Opens Office as Consulting Patent Expert

Mr. Max W. Zabel, whose work in the manufacturing field is well known to most telephone men, has recently opened an office at 1362 Monadnock Block, Chicago, Ill. He will furnish expert opinions on American and foreign patents, trade marks, and copyrights.

For this work Mr. Zabel's education and experience have particularly well fitted him. After graduating from the University of Wisconsin in 1898 he spent three years in the study of law, prosecution of patents and kindred work in Chicago. During this time he assisted, with Mr. O. M. Leich, now chief engineer of the Cracraft, Leich Electric Company, in developing the Leich four-party multiple frequency selective system, and associated himself with the American Electric Telephone Company to improve these patents and assist in putting the apparatus upon the market. The work of introducing this system was very difficult, as the Independent telephone managers at that time were not in favor of party line service, although in most exchanges their attitude has now been completely reversed. For the past four years, until his resignation a few weeks ago, Mr. Zabel held the position of sales manager with the American Electric Telephone Company. During this time he has also done a great deal of patent work and engineering, having perfected a number of inventions, among which is the eight-party system which has been advertised extensively under his name by the American Electric Telephone Company of Chicago.

From now on he will devote his time exclusively to the prosecution of patents and also to such engineering work and promotion of patents as are incidental to the field he has selected.

A New Frequency Meter

One of the most important factors in the successful operation of the harmonic system of selective ringing is the keeping of the various currents used at the proper frequencies. The limits of allowable variation are narrow. Cases have been recorded where a variation of 1½ per cent either way in the speed of the ringing current generator would cause a stream of "can't raise" tickets to come into the test room. Where a multi-cycle set is used for the source of ringing current the frequency can be found at any time by a speed indicator and a watch. However, in a large number of cases the ringing currents are furnished by pole changers.

Since these pole changers have no rotating part, determination of the frequency of the current delivered has been a task of some difficulty. Although the meter here described furnishes a convenient means of measuring the frequency of any alternating current, it was primarily designed to meet the need of a meter to be used with pole changers.

The principle employed is that of counting the alternations which pass through an electromagnet in a given time. To this end a spring-driven wheel is held from rotating by a pallet mounted on an oscillating shaft. Fixed on this shaft is a light polarized armature, which is held by one or the other pole of an electromagnet through which passes the current whose frequency is to be measured. Each alternation, by reversing the polarity of the electromagnet, allows the force of the wheel to detach the armature from one pole and throw it to the other where it is held until the next following alternation. Connected to the escape wheel by suitable reducing gears are hands which move over a dial. The hands are set to zero, current is

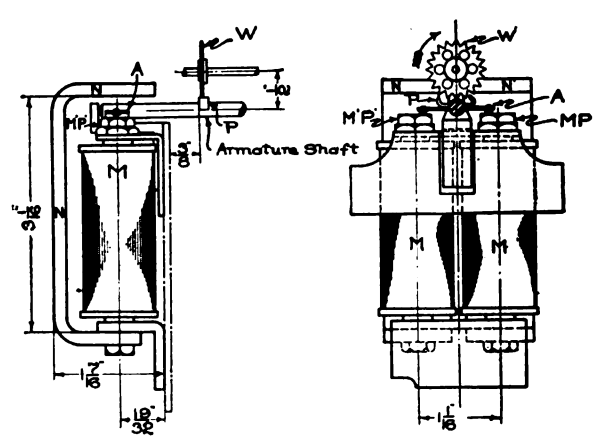

Fig. 1.—Detail Front and Side Views of New Frequency Meter.

allowed to pass through the magnet for a given time and, since each alternation permits the hands to advance, the total alternations during the period may be read from the dial.

The highest frequency used in telephone work is 4500 cycles per minute or 75 cycles per second; this requires the escapement to act very rapidly to respond to such a current. The method of obtaining this speed may be explained by reference to Fig. 1.

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As prime-driven wheel *W* has teeth which engage with the impulse faces of the pallet *P* mounted on a rock shaft. To this shaft is attached a light armature *A* with ends similarly polarized by the permanent magnets *N* and *N'*. An electromagnet *MM* has poles *MP* and *M'P'* which act as stops to the motion of the armature and hold the armature in either position against the force of the wheel as transmitted through the pallet. For example, assuming the left-hand armature to be held by *M'P'*, if a current is now sent through *MM* in a direction to weaken the magnetism of *M'P'*, as soon as this holding force is made less than the force of the wheel tending to throw the armature from the magnet, the armature will rotate to the right, come in contact with the *MP*, the tooth of the wheel will escape the right-hand point of *P* and the escapement will come to rest with a tooth of the wheel locked on the left-hand point and tending to rock the shaft to the original position. However, this motion will be prevented by the attraction of *MP* for *A*. The next reversal will weaken the electromagnet, and the armature will then return to its original position. It is evident that for each cycle of two alternations the wheel *W* will be advanced one tooth, and by connecting hands to *W* by suitable reducing gears the number of cycles passing through *MM* may be read.

This escapement is very sensitive, for all of the work of rocking the pallets with the attached armature is done by the force of the wheel, which, as before stated is driven by a spring. In practice the inventor states that he has had no difficulty in constructing this escapement to respond positively to currents of 165 cycles per second, considerably above the frequencies met in commercial work. If there were any reason for so doing it is probable that the mechanism could be made to respond to frequencies of 300 cycles per second, since it is only a question of the torque on the wheel *W*. In this case, however, one would perhaps have to use a small transformer to step the current up to about 400 volts to overcome the high impedence of the magnet *MM* at that frequency.

The current required to run this meter is very small, on the order of 0.005 amp; the magnet is made with a resistance of about 1000 ohms and with this resistance requires for a current of 70 cycles per second a voltage of about 80 across its terminals. For lower frequencies less voltage is of course required.

From the construction of this meter it will be seen that its indications are independent of the wave form of the current measured. In fact, since there is a condenser wired in circuit with the magnet *MM* it will respond to makes and breaks of a unidirectional current. It is not affected by temperature or variations of voltage. Providing that enough current is sent through it to work it, any excess will not change its indications.

While this meter was designed primarily for work with pole changers, it is very convenient for measuring the frequency of

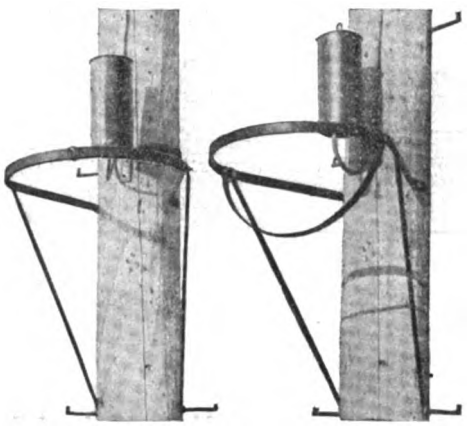
Fig. 2.—The Holtzer-Cabot Frequency Meter, Mounted in Case.

an alternating current of any kind. One does not have to be at the generator, as is the case where a speed indicator is used, but may use the meter in any place where the wires carrying the current are accessible.

This meter was invented by Mr. Arthur F. Poole, and is manufactured and sold by the Holtzer-Cabot Electric Company, Brookline, Mass., and 397 Dearborn St., Chicago.

The Coar Safety Seat

Among the specialties sold by the Telephone Appliance Company, of Minneapolis, Minn., is an appliance designed for approximately the same purpose as a pole seat, but constructed on altogether different lines. This is the Coar safety seat. This was designed by a practical man for use under practical conditions, as illustrated below. The framework is rigid, of sufficiently ample dimensions and made of



The Coar Safety Seat Closed and Open.

mild steel. The seat is easily applied to a pole with four bolts, two of which serve as footrests. When not in use the seat is folded up to one side like a jackknife, and workmen can climb through instead of over it, so saving time and avoiding danger. Other advantages are attributed to the fact that it is roomy and comfortable and does not accumulate sleet or snow.

Mr. Jas. A. Kenny, who has been general manager of the American Electric Fuse Company, of Muskegon, Mich., since 1900, severed his connection with that company on July 1. He has opened an office in Chicago where he will act as selling representative for several well-known electrical lines, a complete announcement of which will be made in these columns at a later date. Among the products which he will handle will be those of the American Electric Fuse Company, the president of which has bespoken for Mr. Kenny the friendly co-operation of all its customers. Mr. Kenny is one of the best known men in the Independent telephone field, and his many friends in all sections of the country are offering him cordial good wishes for success.

His offices are at 1112 and 1113 Monadnock Block, Chicago, Ill.

The Stromberg Carlson Telephone Manufacturing Company, Rochester, N. Y., has prepared a circular which can be used to very good advantage by operating telephone companies in increasing the number of extension sets in service. It is very attractively arranged, and presents some good arguments which ought to bring a fair percentage of responses, and thus pave the way for a visit of the contract man.

A Roebling Statue

One of the best known manufacturers of telephone wire and cable is the firm of John A. Roebling's Sons Company, Trenton, N. J., where the vast works are situated, employing 6000 men in the various branches of the wire and cable art. The part borne in the foundation of the industry and in the development of Trenton by the great engineer and inventor, John A. Roebling, has just been publicly recognized at Trenton in the erection of a fine bronze statue by Couper, the sculptor, placed on a granite pedestal in Cadwalader Park. The dedication of the statue took place on June 30, the occasion being a

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public holiday. Over 15,000 people assembled for the exercises and the great force of 6000 artisans, with flags flying, marched to the scene to the music of nine bands. A brilliant oration of a biographical character was delivered by Mr. Henry D. Estabrook, general counsel of the Western Union Telegraph Company, who is connected with the Roebling family by marriage. He told how Roebling had been born in Germany, studied under Hegel and other philosophers, came to America in 1831 and farmed, found his way into canal surveying, and soon discovered his lifework in the making and utilization of all kinds of wire and wire rope. He instanced the Niagara and Brooklyn Bridges as examples of Roebling's genius.

The statue cost about $14.000, and was paid for by public subscription. It is a great ornament to Trenton, and is the first monument of the kind in that city.

THE F. BISSELL COMPANY, of Toledo, Ohio, has issued a new souvenir advance card. The "Bissell Frog" is dictating the orders he receives for Bissell supplies in the course of his travels, in order that no inconvenience may be experienced by purchasers.

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Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

PERSONAL

MR. WM. J. CLEVELAND, district plant superintendent of the Hudson River Telephone Company, has been appointed general plant superintendent, to fill the vacancy caused by the death of Mr. W. Sidney Nicholson.

MR. FRED IRELAND, superintendent of equipment of the Hudson River Telephone Company, has been appointed acting district plant superintendent.

MR. H. VANCE LANE, president of the Rocky Mountain Bell Telephone Company, has been elected general manager, and will assume his new duties at once.

MR. D. S. MURRAY, of Salt Lake City, Utah, has resigned his position as general manager of the Rocky Mountain Bell Telephone Company. After a vacation in Southern California, Mr. Murray will go to San Francisco, where he has a position with the Pacific Telephone and Telegraph Company.

MR. GEO. L. PAVY, who has for the past few years been connected with the Wisconsin Telephone Company, in Milwaukee, as contract agent and later as special agent of the railway department, has recently been appointed manager of the company's exchange at Green Bay, Wis.

MR. R. MYRON SMITH, who for the past year has been associated with the Montana Independent Telephone Company, of Butte, Mont., in the capacity of manager of the contract and collections departments, has resigned to embark in business for himself.

MR. C. J. H. WOODBURY was the recipient of the degree of Doctor of Science, conferred by Dartmouth College, at its commencement, June 24. This is the second time the same degree has been conferred upon him, the first being from Union College, New York, in 1906.

NEW COMPANIES

LA GARITA, COLO.—Articles of incorporation have been filed by the La Garita Telephone Company. It has an authorized capital stock of $3,000, and among the incorporators are C. D. Wadsworth, Michael White and W. E. Gardney, of Center.

CREAL SPRINGS, ILL.—Articles of incorporation have been filed by the Creal Springs Mutual Telephone Company, whose purpose is to install and operate an up-to-date telephone system at this city. It has an authorized capital stock of $2,500, and the incorporators are: H. P. Frick, A. L. Howerton, John R. Rector and others.

FOLSOMVILLE, IND.—An Independent telephone company, to be known as the Folsomville Farmers' Mutual Telephone Company, has been organized at this city, and the following officers elected: John W. Roberts, president; L. L. Williams, secretary. The company, which is to be controlled entirely by the farmers in Folsomville and vicinity, expects to at once commence the installation of an exchange at this city, and the construction of a line to Boonville, where connections are to be established with the lines of the Chandler Telephone Company.

DELPHOS, IA.—The Farmers & Merchants Mutual Telephone Company has been incorporated with a capital stock of $1,500, and contemplates the construction and operation of telephone lines.

FRANKFORT, KY.—Announcement is made at this city that the Trigg County Citizens' Telephone Company has filed articles of incorporation. Its capital stock is placed at $1,000, and among those responsible for its formation are: E. L. Taylor, A. Holland, C. Mitchell and others.

TOMPKINSVILLE, KY.—Articles of incorporation have been filed by the Tompkinsville Home Telephone Company. It is capitalized at $6,000, and the incorporators are: W. S. Smith, J. E. Leslie, William Webb and others. Its purpose is to install and operate an up-to-date telephone system at this city.

COPEMISH, MICH.—The Mutual Telephone Company of this city, which is capitalized at $10,000, has filed articles of incorporation, and contemplates the construction and operation of telephone lines.

DEER RIVER, MINN.—Among the latest companies to file articles of incorporation is the Deer River Telephone Company. It has an authorized capital stock of $5,000, and among those interested in the new enterprise are: Archie McCallum, Deer River; B. L. Freedy, St. Paul; C. D. Rutherford, Floodwood; John E. O'Connell, Deer River; W. Reithner, Deer River.

COPAKE, N. Y.—The Copake Telephone Company has been incorporated for the purpose of constructing and maintaining telephone lines. It has a capital stock of $5,000, and the incorporators are: Fred Holsapple, John D. Ackley, Copake; George H. Finch, Claversack, N. Y.

SYRACUSE, N. Y.—A certificate of incorporation has been filed with the Secretary of State by The Onondaga Independent Telephone Company, of Syracuse. It has a capital stock of $1,500,000, and the directorate is made up of George R. Fuller, W. Roy McCanne, Joseph W. Taylor and Edward W. Peck, of Rochester; Alexander H. Cowie, John B. Pierce and Hendrick S. Holden, of Syracuse.

LIMA, OHIO.—Articles of incorporation have been filed by the Banner State Telephone Company. It has an authorized capital stock of $60,000, and among those responsible for its formation are: John C. Rorick, E. H. Rorick, John P. Rorick, B. S. Young and Walter B. Richie.

CALUMET, OKLA.—Articles of incorporation have been filed by the Starlight Telephone Company, of Calumet. The capital stock is placed at $300, and among the incorporators are George Kennedy, Thomas Jarville, Jeff Pritner and others.

LANDISVILLE, PA.—The Landisville Telephone Company, which is capitalized at $5,000, has filed incorporation papers with the Secretary of State, its purpose being to construct and operate telephone lines. Among those responsible for its formation are: H. H. Koser, P. W. Butler, J. M. Trout, Ezra Miller, D. R. Stouffer, Landisville, and others.

NEW WILMINGTON, PA.—As a result of the merging of nine Independent telephone companies in Eastern Ohio and Western Pennsylvania, it is understood that an association, to be known as the Interstate Telephone Association, is soon to be formed. It is to have a capital stock of $100,000, and will have over 3500 telephones and 1000 miles of wire under its control. The companies entering into this merger are the Independent companies of Beaver and North Jackson, Ohio; New Bedford, Plain Grove, Slippery Rock, Harrisville, Mount Air, Blacktown and New Wilmington, Pa. It is proposed to establish uniform toll rates and secure better accommodations from the bigger companies.

NASHVILLE, TENN.—From this city comes news of the incorporation of the Farmers' Union Telephone Company, of Warren County. It has an authorized capital stock of $5,000, and the incorporators are: Robert M. Horton, Aaron B. Moffitt, Alvadore Golloday, Abner D. Womack and Edward Sparkman.

GERMANTOWN, TEX.—An Independent telephone company has been formed at this city. Its plans include the construction of a line to Fannin, at which place long distance connections are to be established, and a line which is to connect with the Ander telephone system.

LEESBURG, VA.—The organization of the Leesburg Telephone Company has been completed by the election of the following officers and directors: Charles P. Janney, president; W. S. Jenkins, vice-president; C. H. Shipman, secretary and treasurer; directors, the above named officers and W. E. Garrett and M. E. Church. A charter has been applied for and the company is to be known as the Leesburg Telephone Company, Incorporated. Arrangements are being made by the incorporators, who are nearly all local men, to take over the old plant at this city. It is their intention to entirely rebuild it, installing a modern switchboard and up-to-date central office equipment. All subscribers will be given local and long distance connections, enabling every telephone subscriber in Leesburg to get direct connection with Washington, D. C., and other outside points.

TOMS BROOK, VA.—The Mount Olive & St. Luke Telephone Company, of Mount Olive, P. O. address Toms Brook, has filed articles of incorporation, and expects to construct and operate a telephone system throughout Shenandoah County. The capital stock is placed at $5,000, and the following officers have been elected: George A. Copp, Strasburg, Va.,

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president; J. G. Sager, Woodstock, Va., vice-president; Josiah Wisman, Woodstock, Va., secretary and treasurer.

DARLINGTON, WIS.—Articles of incorporation have been filed by the Rural Telephone Company, of Darlington, whose intention is to install and operate a modern telephone system at this city. It has an authorized capital stock of $1,500, and among the incorporators are R. F. Lancaster, Henry McPhillips, John Kilkelly and about 20 others.

MARATHON, WIS.—Articles of incorporation have been filed by the Marathon-Zeigler Telephone Company, whose purpose is to install and operate a modern telephone system at this city. It is capitalized at $1,800, and the incorporators are: J. Barber, J. G. King and Martin Gilman.

MINOCQUA, WIS.—Among the newly incorporated telephone companies is the Minocqua Telephone Company of this city. It is capitalized at $8,000, and those interested in the enterprise are: A. O. Dorwin, D. A. Kahns, A. Jay Bolger, F. W. Rogers, W. H. Bissell, S. B. Bissell and others. Arrangements are being made for the installation of an up-to-date system.

FRANCHISES

MERCED, CAL.—A franchise has been granted by the Board of Supervisers to W. E. Mitchell and others, which gives them the privilege of constructing a private telephone line along the Merced and Turlock Road.

NEWPORT, KY.—Sealed bids for the letting at public bidding of the franchise, right and privilege of entering in and upon the streets, alleys and public ways of the City of Newport, Ky., to erect and maintain all necessary poles and appurtenances thereto, and to establish a conduit system, for the furnishing of a telephone service to the city, will be received by the City Clerk, John W. Davis, up to the 22d day of July. Such bids should be marked: Bids for telephone and telegraph franchise. The term of the franchise is to be for 20 years from the date of acceptance by the General Council, which reserves the right to reject any and all bids.

WAYNESBURG, O.—A franchise has been granted to the Bergholtz Telephone Company at this city, and work on the installation of an exchange is to be commenced at an early date.

MARSHFIELD, ORE.—A franchise for the construction and operation of a new telephone line in Marshfield has been granted by the City Council to R. L. Burett, who, it is understood, has the backing of the Home Telephone Company of Portland. He agrees to install a fire alarm system in the city free of charge, and to furnish bonds in the sum of $2,500 as a forfeit if the telephone system is not started in three months and completed within a year.

WOONSOCKET, R. I.—If the franchise for which the Providence Telephone Company has made application at this city is secured, it is quite probable that the concession of half rate telephones for the city will be granted.

SALT LAKE CITY, UTAH.—An ordinance has been introduced in this city requiring the Bell and Independent Telephone companies to pay 1 per cent of their gross earnings and furnish the city with 40 and 50 free telephones, respectively, in lieu of paying the license tax provided by the license tax ordinance.

DES MOINES, WASH.—A franchise has been secured by J. C. Elsey to install and operate a telephone system at this city.

KELSO, WASH.—Application for a franchise to construct a long distance telephone line in Kelso has been made by the Northwestern Independent Long Distance Telephone Company.

CHATHAM, ONT., CAN.—Arrangements are being made by the Blenheim & South Harwich Telephone Company to apply for a five-years' franchise in this city, it being its intention to enter into competition with the Bell Company, which has hitherto enjoyed an exclusive franchise. If permission to enter the city is granted the Blenheim Company promises that it will install an up-to-date conduit system.

FINANCIAL

CAIRO, ILL.—The capital stock of the Home Telephone Company of this city has been increased from $5,000 to $10,000, and its directors from three to five.

CHICAGO, ILL.—Announcement has been made that the semi-annual interest of 3 per cent on the first mortgage bonds of the Automatic Electric Company are to be paid. These bonds are the ones the Strowger Automatic Telephone Exchange Company received in exchange for its stock, and are quoted in the market at about 85.

FOWLER, ILL.—At a recent meeting of the stockholders of the Fowler Central Telephone Company it was decided to increase its capital stock from $2,500 to $5,000.

INDUSTRY, ILL.—At a recent meeting of the directors of the Industry Telephone Company it was decided to increase its capital stock from $3,000 to $4,000.

MESABA, MINN.—The Mesaba Telephone Company, of which Casper E. Yost is president and Charles A. Gratt is secretary, has filed an amendment increasing its capital stock from $100,000 to $300,000.

OMAHA, NEB.—A fee of $5,003 was recorded in the office of the Secretary of State by the filing of incorporation papers by the Long Distance Independent Telephone Company, whose capitalization is to be $10,000,000, instead of $10,000, as previously stated. Of the stock $4,500,000 is preferred, class A, on which an annual dividend of 7 per cent is to be paid. Five millions of the stock is designated as preferred, class B. The objects of the company comprise practically everything necessary for the purchase, promotion, bonding and operation of a great toll system,

DELAWARE, OHIO.—The capital stock of the Delaware County Telephone Company has been increased from $10,000 to $20,000.

ROMNEY, W. VA.—The capitalization of the newly organized Romney Telephone Company is $5,000, and the directors are: G. P. Miller, Romney; D. A. Daugherty, Augusta; J. J. Cornwall, Romney; H. W. Miller, Paw Paw; George B. Shank, Burlington.

COON VALLEY, WIS.—An amendment to its charter has been filed with the Secretary of State by the Coon Valley Farmers' Telephone Company increasing its capital stock from $4,600 to $15,000.

CONSTRUCTION

OAK GROVE, ALA.—A line to Oak Grove has been erected by the People's Telephone Company, and a number of telephones are being installed in that city.

HEBER, ARK.—The lines of the North Arkansas Telephone Company have been extended from Searcy to Heber, and many other improvements and extensions in its plant are being considered.

EUREKA, CAL.—It is estimated that the new exchange building which is to be erected by the Pacific States Telephone & Telegraph Company at this city will cost in the neighborhood of $12,500, exclusive of the electric wiring.

HARTFORD, CONN.—The Southern New England Telephone Company, which has just completed a new toll line between Hartford and Middletown, is extending its lines in this city, and stringing additional toll line wires between New Haven and Middletown.

CARNEGIE, GA.—A telephone line from this city to Bluffton is being constructed by W. T. Brown.

BOISE, IDAHO.—A new switchboard has been installed at this city by the Independent Telephone Company, and a number of lines are being erected.

SPIRIT LAKE, IDAHO.—An exchange has been installed at this city by the Interstate Telephone Company, and lines are now being built into the residential portion of the city.

CHICAGO, ILL.—A new exchange, designed to ultimately take care of 10,000 subscribers, has been established in the downtown district of Chicago by the Chicago Telephone Company.

CHILLICOTHE, ILL.—The People's Telephone Company is extending its lines north of the city along the Yankee St. Road, and otherwise materially improving its system.

KENT, ILL.—Many improvements in its plant are planned by the Independent Telephone Company at Kent.

ROBINSON, ILL.—The Independent telephone exchange at this city is to be entirely rebuilt under the direction of Johann and Johann, of Pekin, Ill.

SYCAMORE, ILL.—Very satisfactory progress is being made by the Exchange Telephone Company in the installation of its system in this vicinity. Lines are also being built in the township of South Grove.

FORT DODGE, IA.—Work on the installation of its telephone system between this city and Waterloo has practically been completed by the Illinois Central Railroad, and as rapidly as possible it is to be extended into Cherokee and Omaha.

RUSTON, LA.—Among the extensions planned by the North Louisiana Telephone Company is the construction of a line from this city to El Dorado. It is also the company's intention to install and operate a long distance line from Ruston to Little Rock, Ark., and intermediate points.

ALLENS MILLS, ME.—To take care of its increasing business, the lines of the Farmers' Telephone Company are being extended from Allens Mills to Wests Mills, and other construction work is being planned.

GRAND BLANC, MICH.—In order to take care of its new business in the farming district east of the city, a number of new rural lines are to be erected by the Grand Blanc Telephone Company in that section.

PRINCETON, MICH.—The lines of the Marquette County Telephone Company have been extended as far as Princeton. It is believed that the company will need a good sized construction crew on the Swanzey Range all summer to take care of the work it has planned to do.

TRAVERSE CITY, MICH.—The Michigan States Telephone Company contemplates the erection of about seventy miles of line between this city and Manistee, which will give direct connection to the intermediate towns.

WOLVERINE, MICH.—The Northeastern Telephone & Telegraph Company, of Saginaw, which has already completed a metallic circuit line as far as Wolverine, expects to extend its system to Cheboygan, whereby direct connections with Alpena, Bay City and a number of other points can be secured.

HUTCHINSON, MINN.—Plans are being considered by the Hutchinson Telephone Company for materially improving its plant at this city.

ST. CLOUD, MINN.—It is only a question of a very short time when

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a number of rural lines will be connected with St. Cloud, at which place twelve farm lines, with 127 subscribers, now center. The lines being erected are as follows: That of the Fruthville Telephone Company, which is building into the city from Benton County; the Riverside Company's line from Le Sauk; the Le Sauk Telephone Company's line from St. Wendel and St. Joseph townships; the Ness Telephone Company's line from Sherburne County. The town of Luxemburg already has three lines and is building an additional one. The telephone company at Mayhew Lake is building an extension to St. Cloud, as is the company at St. Augusta. It will be but a short time before the entire farming district in the vicinity of St. Cloud will be connected with that city.

FAIRBURY, NEB.—Work on its new exchange building at this city is being carried on at a rapid rate by the Independent Telephone Company, and it is quite probable that it will be ready for occupancy by the first of September.

MONTPELIER, N. D.—A number of new farmers' lines are being erected by the Montpelier Telephone Company to take care of its increasing business.

AUSTINBURG, OHIO.—At a recent meeting of the Austinburg Telephone Company it was decided to install a new switchboard, and make other improvements in the local system.

HAMILTON, OHIO.—The lines of the Home Telephone Company at this city are being thoroughly overhauled.

MIDDLETOWN, OHIO.—Construction work on its new exchange building at this city has been resumed by the Home Telephone Company, whose intention is to install in it the latest type of apparatus.

WINONA, OHIO.—Many improvements in its plant at this city are being made by the Columbiana County Telephone Company.

ELIMSPORT, PA.—The lines of the White Deer Telephone Company are being extended in and around Elimsport.

LOCUST GROVE, PA.—The recently organized Locust Grove Telephone Company has completed its line to Royersford, and is considerting further extensions at an early date.

MEADVILLE, PA.—A new switchboard has been installed at this city by the Bell Telephone Company.

STONY RUN, PA.—To take care of its rapidly increasing business, the Kutztown Telephone Company is extending its lines from this city through Kistler's valley to Lynnville.

WINDBER, PA.—The Windber Telephone Company has transferred its exchange from Scalp Level to this city, and expects to establish connections with Central City, Reitz, Lambertville, Buckstown and a number of other neighboring villages, in the immediate future.

SUMTER, S. C.—The Sumter Telephone Company, which now owns the Bishopville and Summerton exchanges, is also extending its service into the farming districts of Lee, Clarendon and Sumter counties.

BELLINGHAM, WASH.—The lines of the Home Telephone Company are being extended to Alger, Belfast, Bellville and a number of other places.

RENTON, WASH.—The long distance lines of the Renton Telephone Company are being extended to Tacoma.

TACOMA, WASH.—Arrangements are being discussed for the construction of a telephone line from Ashford, in the Succotash Valley, to Longmire Springs, on the west slope of Mount Rainier. It is the impression of the business men of Tacoma that if the matter is properly presented to the Forestry Department the Government will probably take it up. It is understood that the Tacoma Eastern Railroad is also anxious that the line should be built, and has expressed itself as being willing to bear part of the expense. Further consideration is to be given the subject at the annual meeting of the Paradise Valley Club, who have the matter in charge.

ATHENS, WIS.—The extensions in its system planned by the Athens Telephone Company include lines to Frankfort, Gad and Halsey.

COON VALLEY, WIS.—The Coon Valley Farmers' Telephone Company, which has already installed about 115 telephones, is planning for the extension of its lines to Chaseburg, at which place an exchange is to be installed.

SARATOGA, WYO.—A Government telephone line from this city to Gold Hill is being erected under the direction of Supervisor J. W. Nelson.

TORONTO, ONT., CAN.—The Bell Telephone Company is making arrangements for the erection of a new five-story exchange building at this city.

WHEATLEY, ONT., CAN.—A new exchange has been installed at this city by the Wheatley Independent Telephone Company, and work on the construction of its lines throughout the city is being carried on at a rapid rate.

ELECTIONS

TREMONT, ILL.—The Farmers' Mutual Telephone Company of Tazewell County, recently organized at Pekin, and whose principal place of business is to be Tremont, has elected the following officers and trustees: President, John Sommers, Elm Grove; vice-president, John Strickfaden, Groveland; secretary, treasurer and manager, Arthur Becker, Tremont; trustees, Samuel Kinsinger, Theodore Schwarzentraub, A. L. Robinson, Henry Bollinger, Robert Kennedy, Joseph Augsburger. The company expects to start construction work at once on a line that will connect Elm Grove, Tremont, Dillon, Morton and a number of other places.

MASON CITY, IA.—The following officers and directors have been elected by the Farmdale Telephone Company, which has recently filed articles of incorporation, its capital stock being $10,000: G. W. Gibbs, president; M. W. Roberts, vice-president; D. L. Elston, secretary and treasurer; directors, G. W. Gibbs, D. L. Elston, F. J. Coffin, William Roberts and M. Ferman.

GRAND BLANC, MICH.—The following officers have been elected by the Grand Blanc Telephone Company: President, John L. Gundry; vice-president, George M. Coggins; secretary, Jonathan Crasper; treasurer, Cranston Clark; manager, A. D. Banker.

BUTTE, MONT.—The Montana Independent Telephone Company has elected the following officers and directors: President, Harry M. Galwey; vice-president, W. H. Hall; secretary and treasurer, C. J. Kelley; directors, M. S. Largey, Patrick Wall, H. B. Brown, Thaddeus S. Lane, L. O. Evans, C. F. Kelley, Charles J. Kelley, J. T. O'Brien, H. M. Gallwey, of Butte; W. G. Conrad, Great Falls; Thomas Couch, Jr., Great Falls; Frank H. Clinton, of Anaconda.

MALLORYTOWN, ONT., CAN.—The officers of the Mallorytown Independent Telephone Company are: President, Dr. Judson, Mallorytown; vice-president, G. M. Taylor, Lyn; secretary, F. H. Mallory, Mallorytown.

MISCELLANEOUS

MORRILLTON, ARK.—A half interest in the Home Telephone Company at Morrillton, the property of J. A. Frisby, has been acquired by E. J. & O. W. Massey, and the management of the plant is to be assumed by E. J. Massey at an early date.

PINE BLUFF, ARK.—The Long Distance Telephone Company of Arkansas has passed into the hands of a receiver, W. C. Hudson, cashier of the Bank of Pine Bluff, having been appointed by Chancellor John M. Elliott to assume charge of the company and operate it as heretofore. This action has been brought about through the instrumentality of W. D. Hearn, president of the company, who is also the largest stockholder, it being his judgment that it afforded the best means of protecting all interested parties. The company operates long distance lines between Pine Bluff and Little Rock.

HEBRON, IND.—Through a deal recently closed by Robert Ross of this city, the ownership of the Boone township telephone line passes into the hands of Logansport capitalists. It is stated that the line is quite extensive, and that it serves a considerable number of subscribers.

NEVADA, IA.—Arrangements have recently been concluded whereby the Collins Mutual Telephone Company has passed into the possession of Brower & Hollingsworth, a real estate firm of Gettsburg, S. D., the consideration being in the neighborhood of $20,000. The exchange is to be under the management of W. H. Thompson.

TRAER, IA.—In addition to the property in this city, the Traer syndicate, in which C. A. Pratt is largely interested, has secured the telephone properties in Reinbeck and Gladbrook. It is their purpose to consolidate these various properties and their toll lines, and operate them as one system.

HOUSTON, MO.—A one-fourth interest in the Texas County Telephone Company, of Houston, has been acquired by E. D. Croft, of Springfield, who is to take charge of the plant as manager.

GREENSPRING, OHIO.—The lines of the Greenspring Telephone & Electric Company south of this city were badly damaged during a recent storm.

UNDERGROUND

AMES, IA.—The Mutual Telephone Company is placing its wires underground in this city.

IOWA CITY, IA.—A complete conduit system is being installed by the Iowa Telephone Company in Iowa City.

SAC CITY, IA.—It is the intention of the Greene County Telephone Company to place its wires underground.

STORY CITY, IA.—The wires of the local telephone company are to be placed in conduits in this city.

DULUTH, MINN.—The wires of the Zenith Telephone Company are being placed in conduits in the business section of this city.

ASBURY PARK, N. J.—Considerable underground construction work is being done at this city by the New York & New Jersey Telephone Company.

READING, PA.—Permission to place a number of wires underground in Reading has been granted to the Pennsylvania Telephone Company.

AMARILLO, TEX.—It is estimated that about 32,000 ft. of underground conduit will be laid by the Panhandle Telephone Company in this city.

WACO, TEX.—The wires of the Independent Telephone Company in the business section of Waco are being placed in conduits.

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The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone and electrical supply salesman to carry our side line. Vest pocket sample. Address Box 1131, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED.—A reliable line and trouble man. Must be earnest, industrious and sober, with a desire for promotion of his own and employers' interests, rather than a high standing with labor unions; position permanent and wages good. Address Box 1135, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED by common battery manager of 28; thoroughly experienced in all departments; village of over 5000 preferred; now employed; any location considered. Address Box 1134, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

A MAN of 30 with thorough knowledge of the telephone business, who possesses the necessary executive ability to manage and handle men, and has had several years' experience in the engineering, construction and maintenance departments of large telephone companies, whose technical training has been gained from the cold, hard knocks of experience, who is broad minded enough to weigh others men's ideas and profit by them, who has served time as troubleman, chief clerk, inspector, engineer, etc., and understands the laying out of subway and cable construction, pole lines, block distribution and can estimate and make intelligent drawings on construction and reconstruction work of all types, and do a whole lot of other things to earn a respectable salary—"That's me." Write and ask me to "prove it." Address Box 1111, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—Party employed, having full charge of subscription department, desires similar position with firm doing large business in poles and posts. Can take full charge. Good references. Will want big salary. Address, Box 1107, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—By technical graduate, five years' experience with large Bell company. Specialty, successful exchange and plant mantenance. Please address Box 1133, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

TELEPHONE "WANTS"

Advertised in the American Telephone Journal are insured world-wide publicity.

What you *want* someone else has to offer you. We help you get together.

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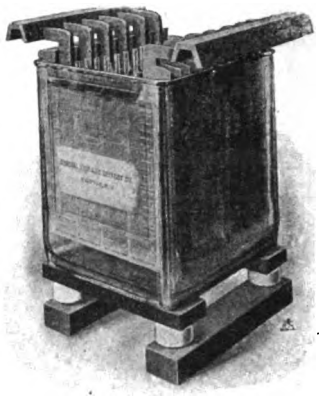
THIS IS OUR SIZE F-13

Capacity 540 ampere hours, or about 33,000 calls on a central energy system

LET OUR ENGINEERS WORK OUT YOUR BATTERY PROBLEMS



General Storage Battery Co.

Offices and Works: BOONTON, N. J.

WESTON

Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS and AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy

Weston Electrical Instrument Company

Main Office and Works, Waverly Park, Newark, N. J.
London Branch—Audrey House, Ely Place, Holborn.
Paris, France—E. H. Cadiot, 12 Rue St. Georges.
Berlin European Weston Electrical Inst. Co., Ritterstrasse No. 88.
New York Office—74 Cortlandt Street.

STANDARD PORTABLE DIRECT READING

VOLTMETERS, AMMETERS, MILLIVOLTMETERS, VOLTAMMETERS, MILAMMETERS, OHMMETERS, PORTABLE GALVANOMETERS, GROUND DETECTORS AND CIRCUIT TESTERS.

Weston Standard Portable Direct Reading Voltmeter. Model 1.

Trouble on Your Lines?

Find It with a Voltmeter.

The new Pignolet catalog tells you how, and contains other information that is worth money to any live telephone man.

The catalog is without price. Why not write for it?

Louis M. Pignolet

80 Cortlandt St. - New York

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Easy Digging

is quick digging—
and quick digging
isdiggingdonewith

The Iwan Post Hole Auger

It augurs ill for your construction account if you are still digging pole and anchor holes with out-of-date tools.

Let us tell you the easier, more economical, in every way better way.

Write for our booklet "Easy Digging."

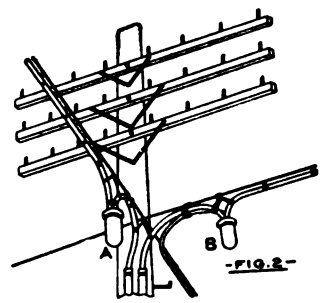
IWAN BROTHERS

Streator, Ill.

Matthews' Cable Splicing Joints

(Formerly called Hargis Joints.)

Patented Oct. 17, 1905



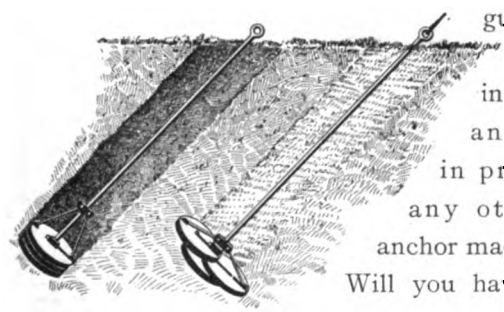
Patent Number 802,337

Fig. 2 represents the use of two No. 3 Matthews' Joints. The one marked A connects a 200 pair U. G. lateral cable with a 200 pair aerial cable, which will permit the opening of the splice quickly to locate trouble either way therefrom. The one marked B joins together a 200 pair U G. lateral cable and two aerial cables of 150 pairs and 50 pairs each, at the same time affording facilities for opening the splice as in the case of A. This drawing was made from a photograph furnished us by R. Cline, Supt. of Construction of the Central Union Telephone Company, Indianapolis.

A Vest Pocket Edition of Specifications
of 32 Pages
on Cable Splicing
Illustrated
Sent Free to Any Address

W. N. MATTHEWS & BRO.
Manufacturers of Patented Money-Saving Specialties
214 North Second Street, St. Louis

The "EVERSTICK"



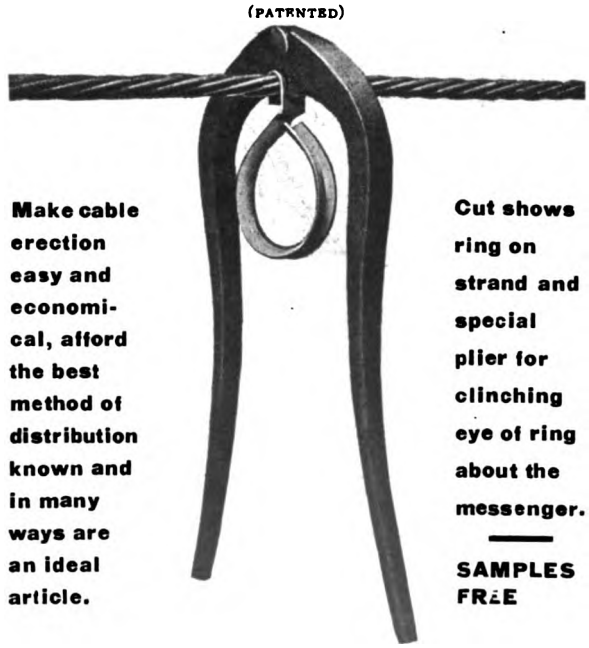
guy anchor is higher in efficiency and lower in price than any other guy anchor made.

Will you have proof?

SPECIALTY SALES COMPANY
Cedar Rapids, Ia.

LOCKE AERIAL RINGS

(PATENTED)



Make cable erection easy and economical, afford the best method of distribution known and in many ways are an ideal article.

Cut shows ring on strand and special plier for clinching eye of ring about the messenger.

SAMPLES FREE

CAMERON APPLIANCE CO., EVERETT, MASS.

TELEPHONE MANUFACTURERS

CARBON 95% PURE

Our imported granular carbon will carry, without frying, three times the amount of current required. Carbon brushes, self oiling. "Remey" magnet steel—the world's standard. Imported tin foil. Copper thread. Condenser paper—the most perfect made. Mica.

W. J. Burns & Co., Agents for Factories—Foreign and Domestic **509 Northwestern Bldg., Chicago**

STAR EXPANSION BOLT CO.

CATERERS TO THE TELEPHONE TRADE

STAR BRIDLE RING

As used with the STAR SCREW ANCHOR in brick or stone.

BAYONNE, N. J.

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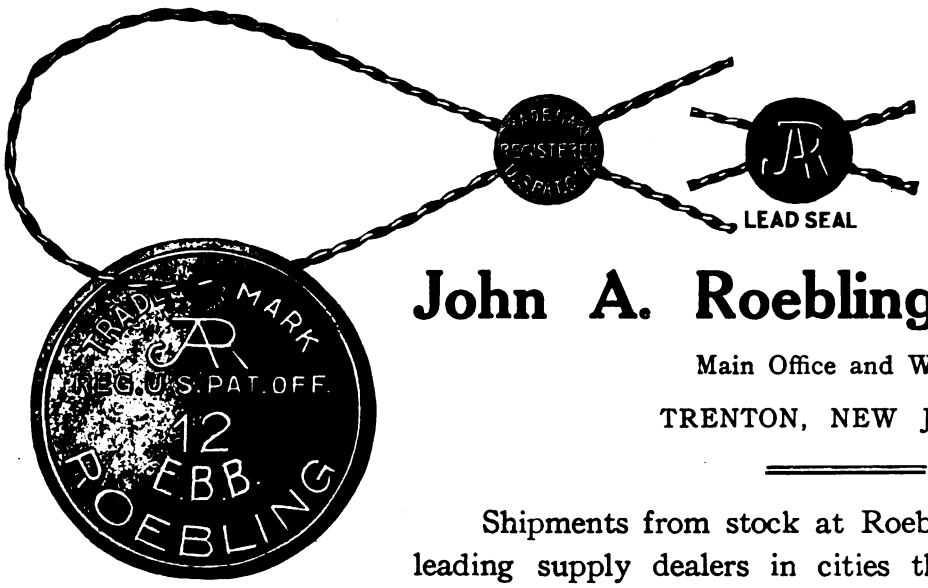
ROEBLING DOUBLE GALVANIZED TELEPHONE WIRE



Drawn from carefully selected and tested metals.

Galvanized by processes resulting from an experience of more than 50 years.

John A. Roebling's Sons Co.

Main Office and Works:

TRENTON, NEW JERSEY

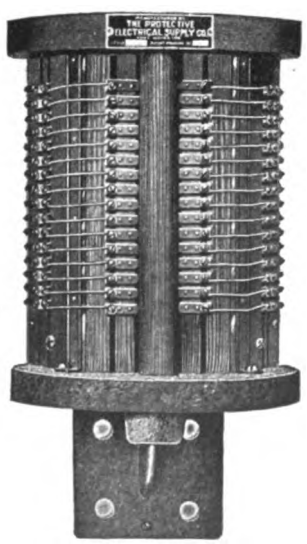
Shipments from stock at Roebling warehouses and by leading supply dealers in cities throughout the country.

LOOK FOR THE ROEBLING SEAL ON EVERY BUNDLE

Buy the "Protective" Cable Terminal

IF YOU WANT

ABSOLUTE PROTECTION AT A LOW COST



NEAT, SIMPLE, DURABLE

NO POT-HEAD
NO WIPED JOINTS

THE BEST ON THE MARKET TO-DAY

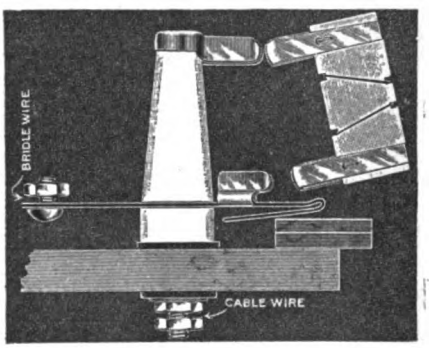
MADE IN ALL SIZES

Send for Illustrated and Descriptive Catalog

Manufactured by

THE PROTECTIVE ELECTRICAL SUPPLY CO.

FORT WAYNE, IND.



Our New Fuse Connection

Porcelain Copper Bronze
German Silver Carbon Mica

You, an experienced Telephone Man, know the meaning of these words.

Absolute Protection,
Practically Indestructible.

All fuse terminal heads are now equipped with this new type of connection.
Would you like to know more about it? Drop us a card for sample.

MOON MFG. CO.

Chicago, Ill.

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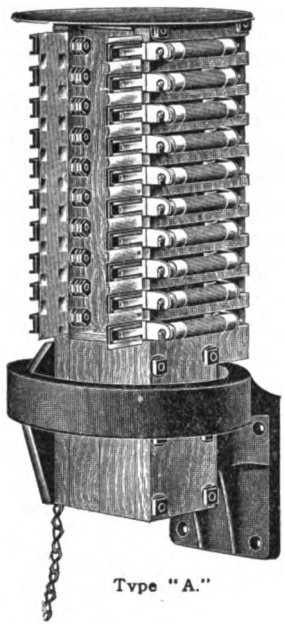
EXTRA GOOD

WRITE FOR NEW PRICE LIST JUST OUT.



Type "A."

SEND FOR COMPLETE CATALOGUE

MANY STYLES

NO WIPED JOINTS

INTERIOR POTHEAD

This style can be furnished in **PORCELAIN** with or without protection. All sizes.

American Electric Fuse Co.

Muskegon, Mich. New York, N. Y.

WE MAKE CABLE

Quality Cable Talks!

¶ You can't expect to get the best talking results unless Quality Aerial and Underground Cable is used. STROMBERG-CARLSON Cables are fully guaranteed — manufactured in our own factory using commercially pure 98% soft drawn copper wire, especially annealed—insulated with a single or double wrapping of pure manila hemp paper of uniform strength, thickness and color and encased in pure lead sheath with percentage of tin if specified.

¶ Every operation in the making, from insulating—twisting—forming core—baking in vacuum oven — sheathing — reeling — and inspecting is under our direct supervision. WE TEST EACH WIRE AGAINST THE BUNCH AND SHEATH GROUNDED USING 500 VOLT D. C. AND GUARANTEE AN **AVERAGE ELECTROSTATIC CAPACITY** AS SPECIFIED IN YOUR ORDER.

¶ This is a good time to place your order. Our prices will be satisfactory and delivery prompt.

BELDEN ANNUNCIATOR WIRE

In coils or on spools

Standard colors in stock

Blue
Red
White
Black
Blue-White
Red-White

Paraffined and polished

Maximum Number of feet to the pound

BELDEN MANUFACTURING COMPANY

194 Michigan Street 44 Chicago

THE SEYMOUR MFG. CO.

SEYMOUR, CONN.

GERMAN SILVER

RESISTANCE SHEET AND WIRE

COPPER WIRE

BRASS, BRONZE AND COPPER

IRONITE

IDEAL DUPLEX DROP WIRE

In the "dog days" IRONITE won't sag or stretch. *Always* costs less than copper.

GET A SAMPLE.

DURANT ELECTRIC SUPPLIES CO., 52 Fifth Ave., Chicago, Ill.

BUY QUALITY BRAIDED TINSEL SWITCHBOARD CORDS THAT LAST

¶ **Results** prove the worth of STROMBERG CARLSON Cords. **Think** of the economical advantages of using cords that may be depended upon for indefinite service.

¶ **From Iowa** we have an unsolicited statement that

60,000 CONNECTIONS

were recorded with our **Tinsel Braided Switchboard Cords** in a test where **all other steel and tinsel cords failed.**

¶ Nothing as good is so cheap—nothing as cheap is so good.

If interested—even a little bit—writs to-day.

Stromberg-Carlson Telephone Mfg. Co.

Rochester, N. Y. Chicago, Ill.

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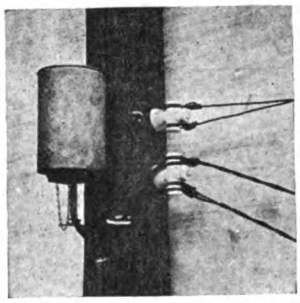

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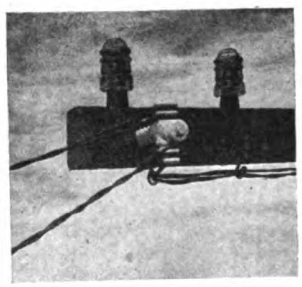
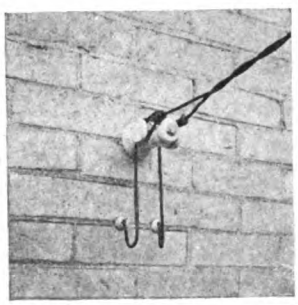


SUGGESTION No. 4



SUGGESTION No. 5

SUGGESTION No. 8

Some "UNIVERSAL INSULATOR" Suggestions

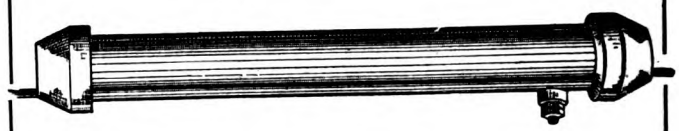
They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
Grooves for any direction—Universal,
All porcelain—No rot or rust and very neat.
Cheap to erect; cheaper to maintain.
WRITE FOR DESCRIPTIVE LITERATURE

UNIVERSAL SPECIALTY CO., 118 S. Seventh St., Terre Haute, Ind.

NO

Lightning Arrester as good as the

Sky Rocket



NO!

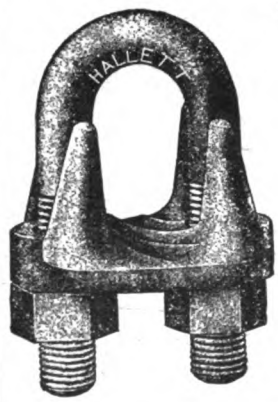
There are in the Sky Rocket

NO spring connections
NO binding posts
NO parts to burn out
NO high resistance
NO carbon to short circuit
NO open circuits
NO loose contact
NO cost of renewal

WRITE!

CHANCE MANUFACTURING CO.

CENTRALIA, MO., U. S. A.



"Wire Rope Clips"

Of course, they are "all right," because they are Hallett's Clips, gotten up so as to never slip, never injure the strand and never break.

Hallett Iron Works

Manufacturers of
Telephone Pole Line Construction Material
92-96 W. POLK STREET
CHICAGO, ILL.

STAR ENAMELED BRIDLE RINGS

For carrying and distributing telephone wires.
Best steel, triply coated with best of tough glass enamel
Write for prices and sample.

STAR EXPANSION BOLT Co.
Bayonne, N. J.

Chapman Arresters

make the best
Backstops for Lightning
They don't need an umbrella in wet weather
Manufactured by
Minnesota Electric Co.
Minneapolis, Minn.
H. E. COBB, Selling Agent,
1530 Monadnock Bldg., Chicago, Ill

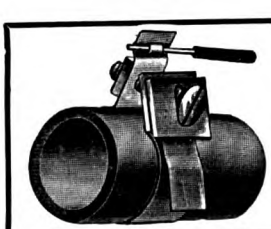
The BLACKBURN GROUND CLAMP

PATENTED

IS THE BEST AND CHEAPEST CLAMP MADE

You may question this statement. If you will let us send you a sample and our prices, you may compare them with others and judge for yourself.

BLACKBURN SPECIALTY CO.
412 Frankfort Ave. N. W. **Cleveland, O.**



M. & B. Ground Clamp

Patent applied for.

For connecting telephone ground wires to lead or iron pipes. Simple in construction; easy to adjust; fits any size pipe. Remains tight whether pipe expands or contracts. No loose connections when our clamp is used. Write us for samples and prices. Milwaukee Electrical Specialties Co., Box 393, Milwaukee, Wis.

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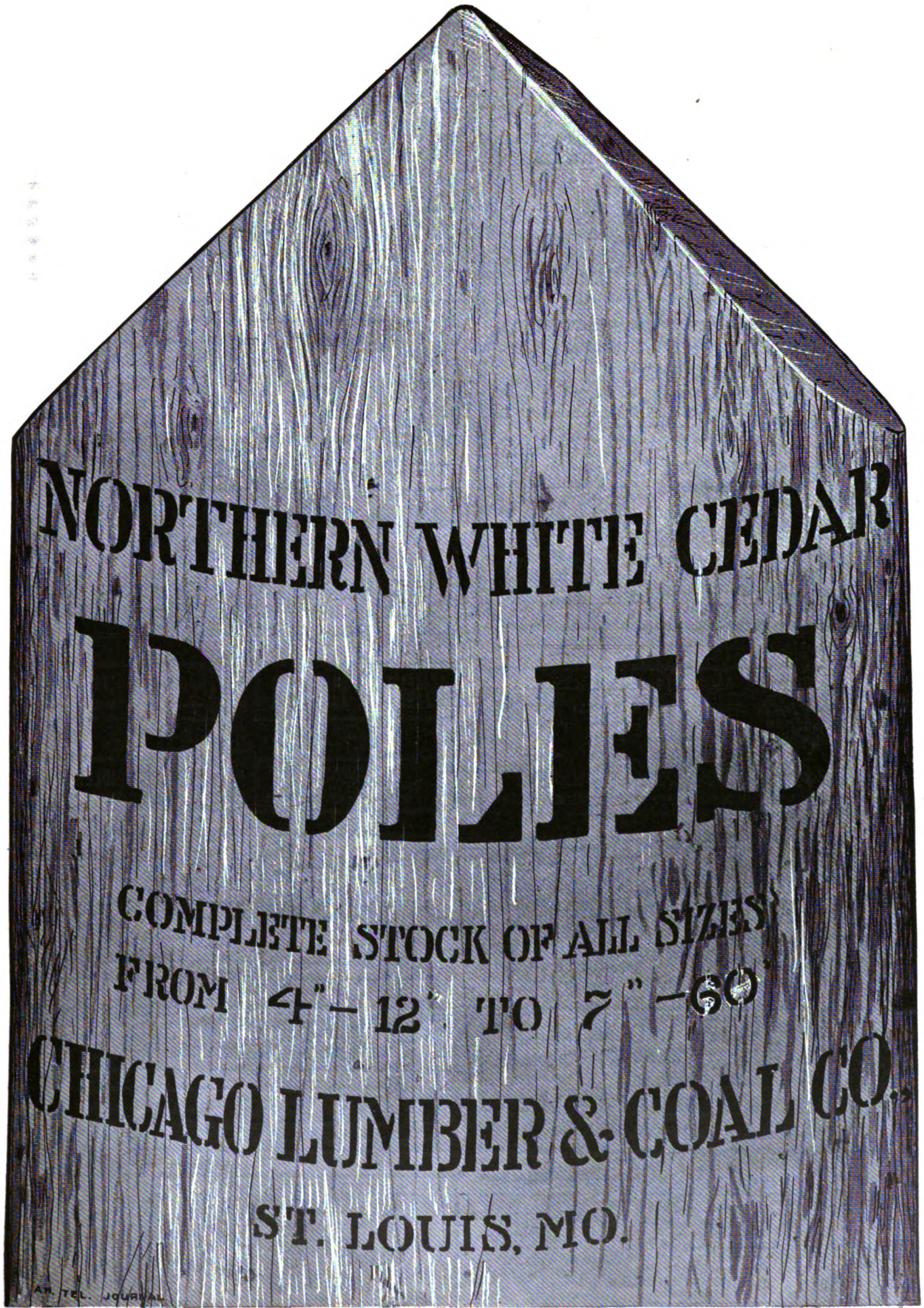

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National Pole Company

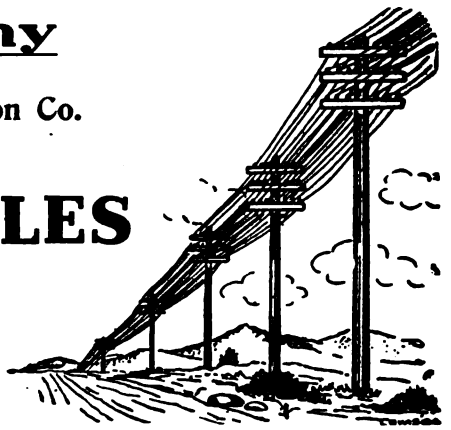
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

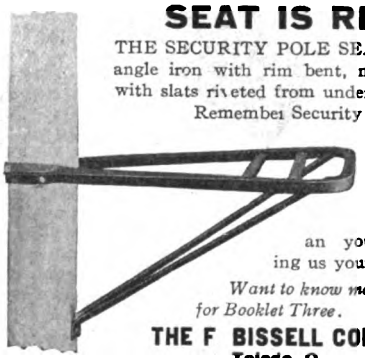
ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from
Maine to Washington



THE PRICE IS RIGHT AND THE SEAT IS RIGHT



THE SECURITY POLE SEAT for Can Tops is built of angle iron with rim bent, not notched at corners and with slats riveted from underneath.

Remember Security construction means—great strength, light weight and neatness. Then bear in mind the price,

$1.25 EACH

an you've every reason for sending us your order.

Want to know more? Ask for Booklet Three.

THE F BISSELL COMPANY
Toledo, O.

WHITE CEDAR POLES

Buy from the Producers
and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

WHITE CEDAR POLES

Prompt Shipment Best Grade

Standard Cedar & Lumber Co.

34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

IDAHO AND MICHIGAN

CEDAR POLES

Large Stocks (10 Yards) Low Prices

Idaho Red Cedar Poles Our Specialty

Western Lumber & Pole Co.

SUITE 416 CHARLES BUILDING - - DENVER, COLO.

WHITE CEDAR POLES

LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—

YARDS: MENOMINEE, MICH. ESCANABA, " SUPERIOR, WIS. DEER RIVER, MINN.

FRANCIS BEIDLER & CO.
CHICAGO, ILL.

Northern White Cedar

POLES

ITASCA CEDAR COMPANY
Deer River, Minn.

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 26 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Boyne Falls. W. C. Sterling & Son Co., Monroe, Mich.

POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY

FARIS & MAYHEW LUMBER & POLE CO.

202 & 203 Continental Building, Denver, Colo.

POLES AND PILING

Chestnut, Red Cedar and Cypress
Lengths 16 to 65 feet

J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES

20 and 25 foot lengths for rural telephone lines a specialty.

PORTER CEDAR CO., Saginaw, Michigan

THE AMERICAN TELEPHONE JOURNAL HAS A LARGER CIRCULATION THAN ANY OTHER PAPER IN THE FIELD

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Evidence of our ability to meet all trade demands:

New customers constantly coming our way

POLES

We have the "goods" and the facilities for supplying you promptly at right prices.

Duluth Log Company

General Offices: Second Floor, Palladio Bldg.
Duluth, Minnesota

The Valentine-Clark Co.

ERNEST L. CLARK, President

Michigan / Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.
Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE
234 La Salle Street — Chicago, Ills.

Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.
Tribune Building, Chicago

LARGE LOTS of LONG POLES

Well Seasoned White Cedar
Immediate Shipment
J. W. Morrison Lumber Co.
General Office: 919 Lumber Exchange, Minneapolis

THREE GOOD REASONS FOR BUYING BISSELL Idaho and Michigan CEDAR POLES are
Quality, Shipments and Price.
Ask for Leaflet Number Three.
THE F. BISSELL COMPANY, Toledo, O.

CEDAR POLES

Have a large stock. Write us for delivered price.

MARSHALL H. COOLIDGE CO.
826 Metropolitan Bld. - - - - MINNEAPOLIS, MINN.

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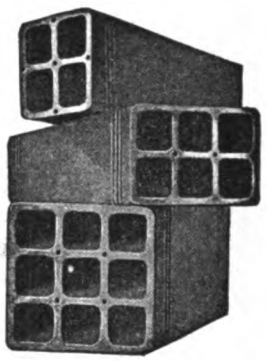
VITRIFIED

CLAY CONDUIT



SINGLE and MULTIPLE DUCT

IMMEDIATE DELIVERY ON ALL STANDARD SIZES

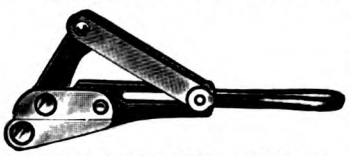
Factories: New Jersey, Pennsylvania, Ohio

Standard Vitrified Conduit Company

Main Offices: 39-41 CORTLANDT ST., NEW YORK, N. Y.

KLEIN'S NEW "CHICAGO GRIP"

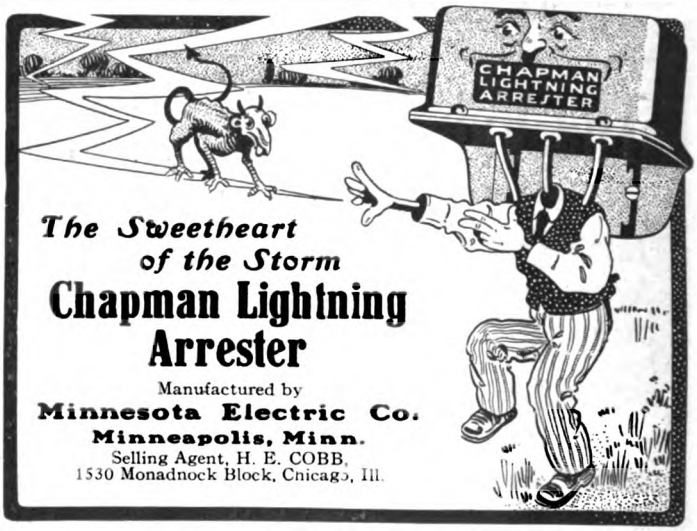
is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.



The Sweetheart of the Storm

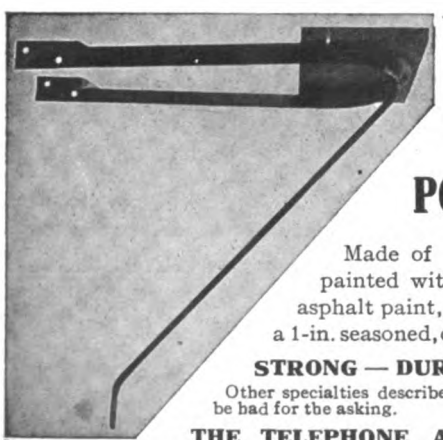
Chapman Lightning Arrester

Manufactured by

Minnesota Electric Co.

Minneapolis, Minn.

Selling Agent, H. E. COBB,
1530 Monadnock Block, Chicago, Ill.



$1.00 YANKEE POLE SEATS

Made of 1½-in. angle iron painted with a weather-proof asphalt paint, to which is bolted a 1-in. seasoned, creosoted pine seat.

STRONG — DURABLE — CHEAP

Other specialties described in our bulletin may be had for the asking.

THE TELEPHONE APPLIANCE CO.
MINNEAPOLIS, MINN.

STAR EXPANSION BOLT CO.
CATERERS TO THE TELEPHONE TRADE

142 Lake St., Chicago Bayonne, N. J. 147 Cedar St., New York

GEO. NASH CO.

NORWAY IRON & STEEL SPECIALTIES

CATALOGUE FURNISHED

NEW YORK
217 Pearl Street

CHICAGO
115 Washington Boul.

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OUR SPECIFICATIONS

COMMERCIAL

A—Compound pours freely at 300 deg. Fahrenheit.
B—Compound exerts no corrosive action on bright copper at a temperature from 300 deg. F. to 350 deg. F.
C—Flashing point of compound 418 deg. F.
D—Burning " " 510 " F.
E—Compound shows no cold flow.
F—Compound loses practically nothing (.005%) after 24 hours at a temperature from 224 deg. F. to 245 deg. F.

Note high melting point, making it especially desirable for Southern climates.

Ask for prices on "Commercial Cable Compound." Made to above specifications—weighs 8 lbs. per gallon.

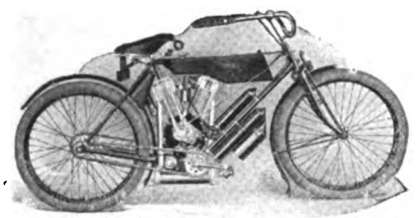
COMMERCIAL

Commercial Electrical Supply Co.

ST. LOUIS, MO.

"THE" Supply House for Cable Construction Materials.

"R.-S." Motorcycle



THE IDEAL MACHINE

For Telephone Companies, Line Men, Trouble Hunters, Collectors, Etc.

Can be fitted with R.-S. luggage carrier.
Powerful, simple, practical, economical, reliable.
The first and only real Mechanical Intake Valve Motorcycle made and marketed in the United States. Thousands in successful use. The only Motorcycle to climb Pike's Peak. Full of practical features and improvements.
The "R.-S." line comprises Single and Twin Cylinder machines, Tandems, Tricycles, Tri-Cars and Delivery Vans, and represents the most value as well as the most advanced motorcycle construction.
Hundreds of testimonials from every part of United States showing "R.-S." achievements in racing, record making, hill climbing, and endurance tests, sent *free* with complete illustrated catalogue, on request to Dept. A. T.

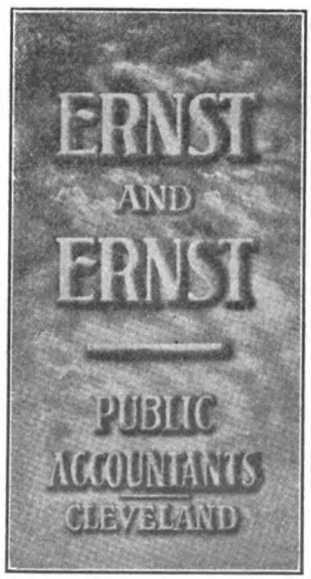
Reading Standard Company, Reading, Pa.

Makers: The Renowned Reading-Standard Bicycle

SOME OF OUR CLIENTS

The United States Telephone Company, Cleveland
The New Long Distance Telephone Company, Indianapolis
The Cuyahoga Telephone Company, Cleveland
The Toledo Home Telephone Company, Toledo

Our Systems Reduce Expense and Give You Accurate Results



Complete Typewritten Financial Statement Furnished With Each Audit Report

The Indianapolis Telephone Company, Indianapolis, Ind.
The Citizens Telephone Company, Columbus, Ind.
The Citizens Telephone Company, Delaware, Ohio
The Belmont Telephone Company, Bellaire, Ohio

Correspondence Solicited

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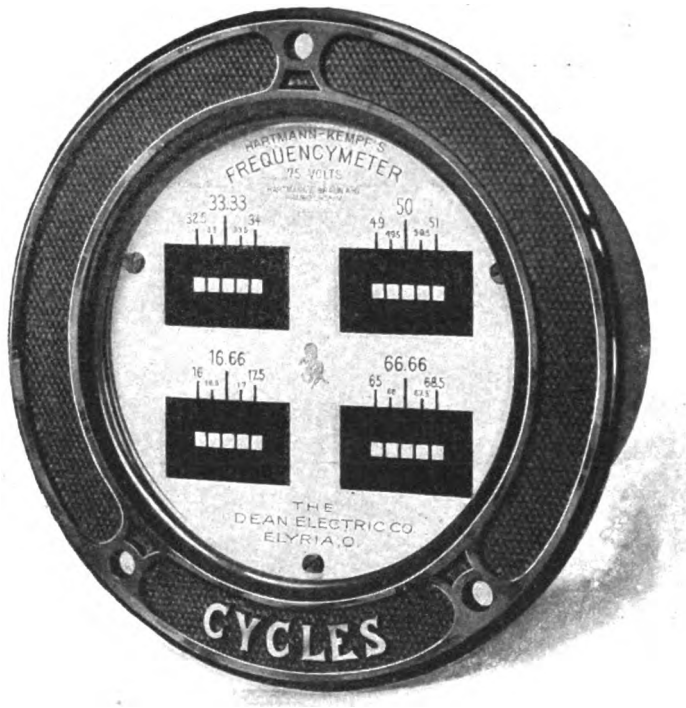


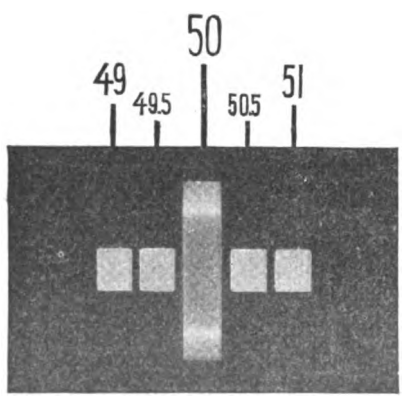
SCIENTIFIC SELECTION

¶ **The "Dean" Harmonic System** is still the only successful party line selective ringing apparatus in the world.

¶ **Absolutely no Failures** is the "Dean" record since the introduction of our Harmonic Converter (registered trade-mark) and our Harmonic telephones.

¶ **No Working Installations** can be shown by some of the makers of imitating appliances—hence the long list of "Dean" successes is abundant proof of superiority.

¶ **Even the Slightest** uncertainty is now eliminated —"Dean" selective ringing is an exact science through the use of the



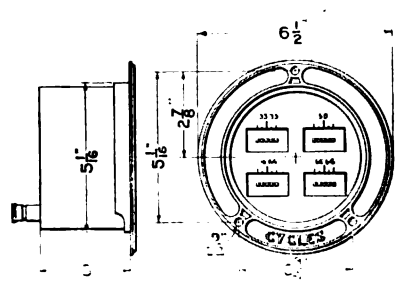
Hartmann-Kempf Frequency Meter.

¶ **With this Instrument** the number of cycles per second may be readily determined—the reading is instantaneous.

¶ **Plain Readings** are indicated by the reeds which vibrate as illustrated. Each of these reeds is a separate unit, even if one should be broken, the efficiency of the others would not be impaired.

¶ **Their Permanency** has been proven by three years' continuous vibration before the invention was marketed.

¶ **Hartmann-Braun A. G.,** the manufacturers, of Frankfort a/M, Germany, have made us the American sales agents for this special instrument.



¶ **The Exact Dimensions** are shown in this drawing. The meter may be mounted in a portable case, or on a suitable mounting board above your power panel; or, it may be specified for any new "Dean" board.

¶ Send for Dean Folder No. 15.

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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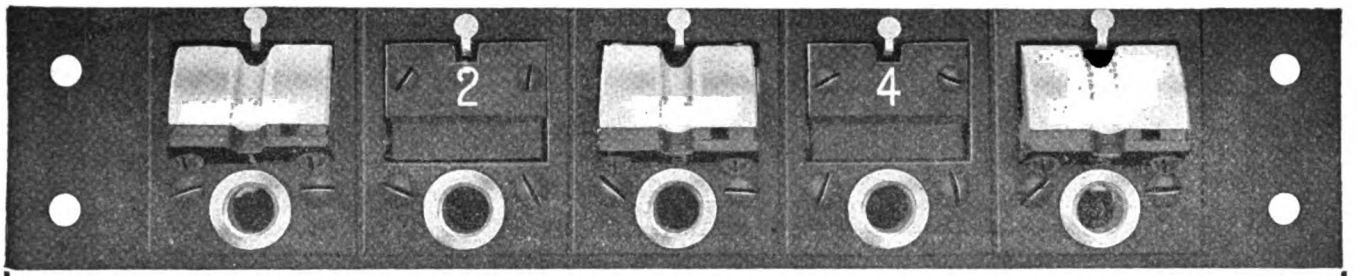


NO. 8 SELF-RESTORING GRAVITY DROP
FOR
150-LINE MAGNETO SWITCHBOARD

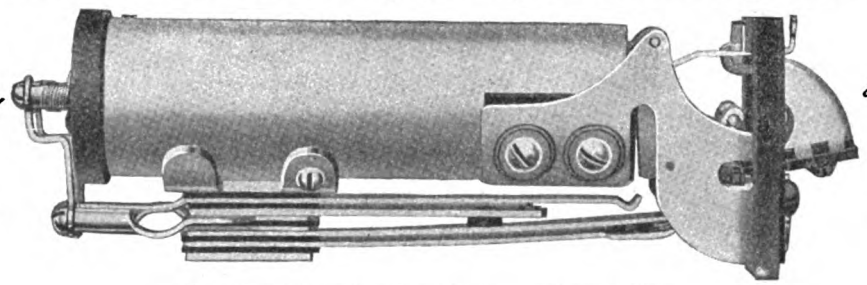
¶ The **"drops"** and **"signals"** designed for use on telephone switchboards have in the past usually involved to a great degree, lack of sensitiveness and reliability, which has rendered them either undesirable or impossible of use under many conditions for which, in order to secure sensitiveness of operation, more delicate apparatus and at the same time apparatus very easily thrown out of adjustment has necessarily been made use of.

¶ Our **No. 8 Self-Restoring Gravity Drop** is both sensitive and reliable in operation and not easily thrown out of adjustment. Besides each drop can be removed from the switchboard without change of adjustment.

¶ The shutter and indicator are automatically restored when plug is inserted in jack, such operation exerting a uniform resistance to the insertion of the plug during the whole restoring interval.

STROMBERG CARLSON
REGISTERED TRADE MARK

Quality Apparatus



STROMBERG CARLSON
REGISTERED TRADE MARK

Quality Woodwork

No. 8 Self-Restoring Gravity Drop—Actual Size.

¶ The indicator is plainly visible from different directions and constructed to display a plurality of differently exposed **white** surfaces, so that one or more surfaces shall always be prominently in view, regardless of the position of the operator. A combination visual and audible latch indicator and a positive strong night-bell contact is also provided.

¶ Outer surface of indicator is flush with the face of mounting strip when in normal or set position, securing a neater and less cumbersome mechanical construction than heretofore obtained.

¶ All tool-made parts are secured in proper relation to each other independently of mounting plate—no re-adjustment of interchangeable parts necessary before or after mounting drops on mounting strip.

¶ The complete drop coil and core are instantly removable without disconnecting any terminal wires or removing of individual drop.

¶ **No. 8 Drops** mounted in units of five (5) on Bower Barff finished mounting strips in our 150-Line Capacity A-5360 Golden Oak Magneto Switchboard Cabinet provides an economical and efficient equipment.

¶ Consider **Quality Apparatus** in this form with all other Magneto Switchboards—then write us for prices—High Quality—Regular Prices.

STROMBERG-CARLSON TEL. MFG. CO.
ROCHESTER, N.Y.-CHICAGO, ILL.

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"An Ounce of Service

is worth a ton of sentiment." That's a pretty good motto. It occupied a prominent place on the walls of the Illinois Association's Convention Hall in Champaign the last week in May. It was the keynote of the Convention; it is becoming the keynote of the Independent movement.

That Ounce of Service—

Are you giving it to your subscribers, or are you giving them a fraction of it and the rest in sentiment? The people who have had their ton of sentiment in connection with the Independent movement are now clamoring for their ounce of service.

You can give it

to them, in quantity, perhaps, with your present manual equipment, but you can't give it in quality without automatic equipment. The Independent-Bell struggle is going to result eventually in the "survival of the fittest." Get automatic equipment and be among the fittest.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Benton, Minn.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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JUST ONE GLANCE

PATENTS PENDING

is *all* that is necessary to impart the character of this telephone—the arrangement of apparatus and wiring, which is *unique* and distinctive of **Cracraft Leich apparatus.**

Such *extraordinary* individuality is not based upon *one*, but a *number* of qualities.

Sound engineering thought and care have been spent upon *each individual part* of the apparatus composing the whole, making each part a unit of *high character* and the complete telephone a *standard* of excellence.

Only materials which experience has proven *best* for the particular work required are used. The tools and appliances employed in its construction are of the *latest design* in the art of modern manufacture. This insures a *uniform* and *well assembled* product and makes it possible to put this telephone upon the market at a *satisfactory price.*

SEND FOR FURTHER PARTICULARS AND PRICES

Cracraft Leich Electric Co.

GENOA, ILLINOIS

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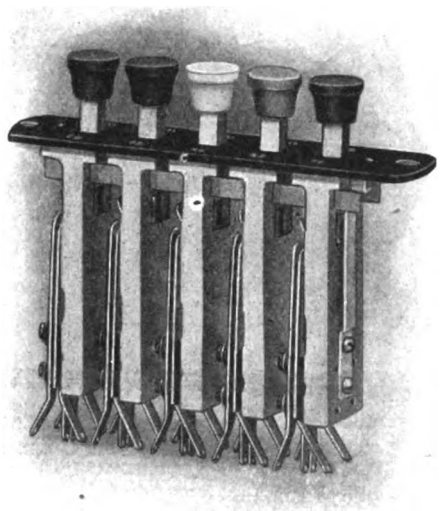
The Monarch Four-Party Master Key



This key—designed for our direct current four-party system—is so constructed that the pressing of any button releases any of the others. It is therefore impossible to have both direct and alternating currents on the line at the same time.

The contact springs are long and the strain of operation is distributed throughout their entire length. Hard rubber rollers act as bearing points against these springs and further reduce the wear.

Each group of contact springs is mounted on a separate frame and can be removed easily without disturbing the other groups or even interfering with their operation.

If interested in four-party systems don't fail to investigate our DIRECT CURRENT system. It has features which surely will attract you.

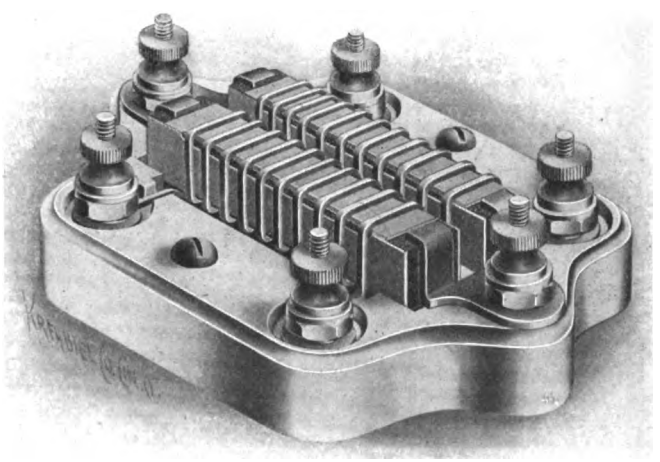
Let us send you a catalogue.

MONARCH TELEPHONE MANUFACTURING CO.

Factory and General Office
Washington and Morgan Streets, CHICAGO, ILL.

Branch House
177 Main Street, DALLAS, TEX.

A Guaranteed Lightning Arrester



OUR PHONES, when equipped with our arrester, are guaranteed not to burn out for **one year** from date of purchase.

Write for our guarantee proposition and special prices on rural line phones.

THE SUMTER TELEPHONE MFG. CO.

SUMTER, S. C.

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"ROBERTS" AND WHAT IT MEANS

6 The Roberts System offers the following strong advantages: Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vica versa, Reduced Costs, Increased Revenues, Etc., and adaptability to any existing local battery exchange.

Central Controls

The operator completely controls the line—at all times and under all circumstances—in spite of anything that any subscriber may do. She can give talking connection to any subscriber and take it away from him with equal facility—take the line away from one and bestow it on another at will. She may place two subscribers on the same line in talking connection with each other, one on each side of the subscriber from whom the line has just been taken, and the latter will be absolutely locked out. The "line hog" and similar nuisances can be effectively controlled. No subscriber can hold the line to the detriment of the service nor against the Emergency Signal. The three minute rule can be rigidly enforced.

Better send for Bulletins which go into details.

HOMER ROBERTS TELEPHONE CO.

1700 Melrose St. Chicago

The Ace High on Quality

The Deuce Low on Prices

1908 Apparatus and 1908 Prices

Central Telephone & Electric Company

ST. LOUIS **Everything Telephonic** **DALLAS**

Attach this advertisement to request of Telephone Company for prices—you get a pack of Shield Emblem Cards—we get the Orders.

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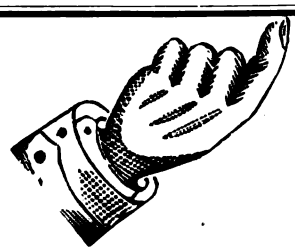
THE nearer the manufacturer can come to the time when the purchaser feels the need of his goods the surer he is of making an impression. If you talk to a possible customer once a month, on the 25th of the month, and he does not feel the need of your goods until the 24th of next month, thirty intervening days will have weakened the impression of your advertising. The weekly is never more than four days from the customer's day for buying.—*Curtis Publishing Company*



THE AMERICAN TELEPHONE JOURNAL is the one strong weekly publication in the telephone field. ¶ It is read by every man vitally interested in the industry, by every man who has purchasing powers, by every live man responsible for the operation of a telephone exchange.

¶ That is *why* the Journal is the best advertising medium in the field. ¶ If not already represented in it, or if using only a small card in it, give the Journal an opportunity to demonstrate what large, live, forceful advertising can do for you.

American Telephone Journal

239 WEST THIRTY-NINTH STREET, NEW YORK CITY

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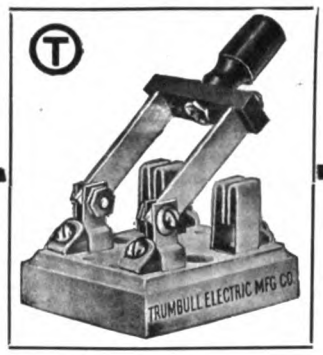
TRUMBULL TELEPHONE SWITCHES

AT GREATLY REDUCED RATES



Self-adjusting clips held firmly in the recesses in the base insure a proper alignment and prevent loose, resistance introducing contacts. Selected high-grade porcelain only used for bases. Each switch undergoes thorough test and inspection before leaving our factory.

THE TRUMBULL ELECTRIC MFG. CO.

NEW YORK 136 Liberty St. PLAINVILLE, CONN. BOSTON 65-67 Oliver St.

WE MAKE TOLL TICKETS BY THE MILLION

By means ot new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
Toll Journals	Trouble Tickets
Toll Ledgers	Rental and Toll Bills
Monthly Check Reports	Voucher Checks
Cash Books	Card Index Systems

Steel Telephone Signs

All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY
DEFIANCE, OHIO

ANDREWS STEEL ROD TELEPHONE

Operator's Revolving Chair

No. 78 M.

Steel Foot Rest—Seat and Back readily adjustable to occupant—Height of Chair easily regulated. Frame work made of Bessemer Steel, ⅜ (three-eighths) inch rods twisted and interwoven. Wood work, oak, birch or mahogany finish, as preferred. Metal work heavily plated, Japanese copper finish.

The Most Comfortable High Chair Made

The Most Attractive and Convenient

INDESTRUCTIBLE

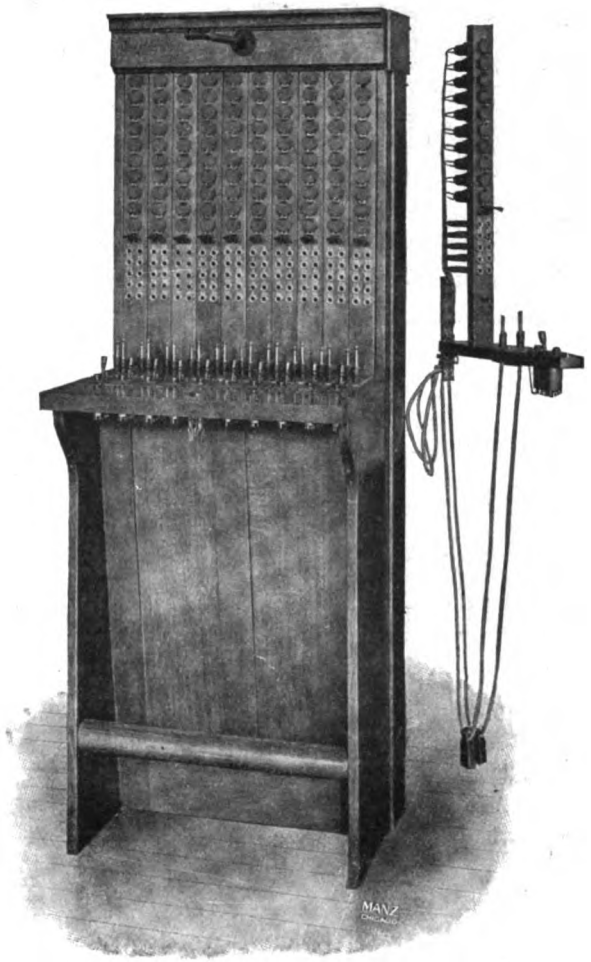
Nothing to get broken

24-inch high 28-inch high

Warranted for 10 years. Send for complete Catalogue and Prices

The A. H. Andrews Co.
174-186 Wabash Ave.
Chicago, U. S. A.

No. 75 M. Toll Board Chair.



Sectional Type Switchboards

Cabinet made any size. Drops and Jacks mounted in strips of ten each. Each strip complete with RINGING and Listening Key and one pair of cords and plugs. Buy cabinet; add strips as required.

Write for Prices

STERLING ELECTRIC CO.

GOOD GOODS

La Fayette, Ind.

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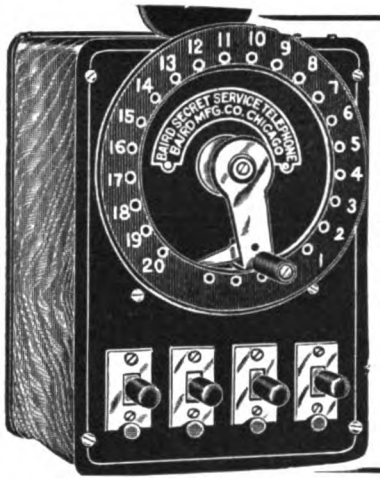


Operator's Calling Device

BAIRD PARTY-LINE SECRET-SERVICE TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

Write for Catalogue and Testimonials.

BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.

U. S. COMBINED

CASH REGISTER and PAY STATION

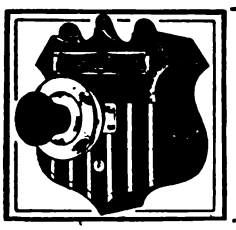
GIVE THE BEST SERVICE

Single Gong only — A Cash Ticket with every collection

NO ERRORS — CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.



WITH **GRAY PAY STATIONS**

NO LEVERS
NO SPRINGS
NO TROUBLE

YOU SIMPLY DROP THE COIN

GRAY TELEPHONE PAY STATION CO.

SEND FOR CATALOGUE No. 50 — HARTFORD, CONN.

"REBUILT"

TELEPHONE EQUIPMENT is "REBUILT," not "REPAIRED"

One's like "New," the other's "Old"---always will be

Our "Rebuilt" Equipment Department "Rebuilds" Switchboards—Telephones—Apparatus—Additional Switchboard Equipment—and Handles Wire—Cable—Cords—Everything Telephonic.

GUARANTEED SAVING 30 TO 50 PER CENT.

Get Quotations, and if you want our "Rebuilt" Bargain Bulletin sent you regularly—say so—it's FREE. *Address*

"REBUILT" EQUIPMENT DEPARTMENT
PREMIER ELECTRIC CO.
56 W. VAN BUREN STREET, CHICAGO, ILL.

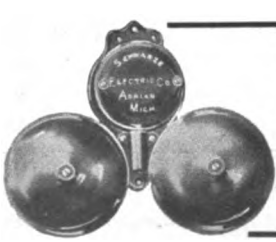
Remember "Rebuilt"—that's OUR word

The Mansbridge Self-Sealing Dreadnought Condenser

Proof against short-circuit or breakdown.
Unharmed by lightning discharges or contacts with power circuits.
Small, light and inexpensive.
Reduces maintenance costs.
The standard for all purposes where reliability is required.
Apparatus to be up-to-date must be fitted with the

DREADNOUGHT

Patented by
G. F. MANSBRIDGE, St. Margarets, Sanderstead, Croydon, England
but Manufactured in U. S. A.
New York Office: Care of Louis DeJonge & Co., 71 Duane St.
Applications for license to manufacture should be addressed to the Patentee.



Magneto LOUD RINGING Extension

TELEPHONE BELLS

Size of gongs, 6 in., 7 in., 8 in., 9 in., 10 in. All resistances. All weather proof. Efficiency, durability and price will interest you.

SCHWARZE ELECTRIC COMPANY
Main Office and Factory: Adrian, Michigan

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Samples FORTY CENTS, Prepaid

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American Telephone Journal

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Telephony in France

If the indications mean anything, there seems to be something radically wrong with the development of telephony in France at the hands of the government. A well-known French nobleman, who contributes to a New York newspaper, says in some recent correspondence: "Our amiable government is introducing the American telephone system, and the real meaning of the American system seems to be that you cannot get anyone on the telephone." When one realizes that this refers to proposed improvements in the service, it will be seen that the situation has become a very difficult one. The same correspondent tells the story of a prominent man who, after trying unsuccessfully for 20 minutes to use his telephone in Paris, made a complaint and was insulted. He thereupon got into his automobile, drove to the telephone office and asked for the superintendent. He stated his business and asserted that he had been insulted over the wire. His statement, it is said, was received impudently, and when the Count expressed "the natural indignation of a gentleman," he was seized by five men in the office, violently ejected, thrown downstairs, and his gray frock coat torn from his shoulders, while scores of telephone girls looked from the windows jeering noisily.

This is certainly an amusing picture of the amenities of telephony in Paris, and one might not take it seriously were it not for the confirmation from other quarters. The leading comic journal of Paris a week or two ago depicted a citizen in a somewhat advanced state of mellowness talking vociferously into the orifice of a letter box. On being remonstrated with by a gendarme, who informed him that that was not a telephone, the citizen replied that he knew it, but that the letter box would take his message a good deal quicker than the telephone.

At the other end of the scale of public opinion we find the sentiments of the distinguished economist, Yves Guyot, who in the Paris *Siècle* of June 23, expresses it as his opinion that the best thing that can happen to the telephone in France is to have it pass into the hands of private management. He instances a conversation with a doctor, who states that several of his patients had visited him in an exasperated nervous condition induced by efforts to use the telephone, and had remarked that State monopolies are excellent recruiting agents of neurasthenia.

In the course of his article Mr. Guyot discusses the various terms upon which subscribers are allowed to use the service, and points out that by one of the articles of the contract the government can interrupt the service for 15 consecutive days at a time without diminution of the subscription. He also points out that under another article any dispute over the wire with employees can bring about a suspension of the service without right of appeal. To put it in his own language, "the government service can inflict a fine at its own caprice without debate, without control, and on the decision pronounced secretly

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by a functionary. The amount of this fine depends upon his own good pleasure, for the suspension of the service can be extended even to the end of the subscription."

Without going any deeper into the matter at the present time, we may be permitted to express our gratification that neither of our great political parties recently assembled in convention has thought fit to incorporate as a plank in its platform any declaration in favor of government ownership of telegraphs and telephones. That folly seems fortunately to have died out of practical politics.

The Telephone as a Detective

In a recent opinion, Police Commissioner Bingham of New York, expressed his belief that as an aid to justice, police news should be kept from the newspapers until the perpetrators of the crimes had been arrested, as the opportunities of making the capture would thus be facilitated. On the contrary, Lincoln Steffens, a well-known magazine writer, argues in one of the July periodicals that this is a wrong idea, and that the best and first thing to do is to enlist the aid of the newspapers in the event of any crime having been committed. According to him, the first thing the victim of a robbery should do is to "telephone to the newspapers, all of them. That would soon show what a small proportion of the reported cases a detective bureau like that of New York detects, and will make the police work on your case."

There seems to be some reason in Mr. Steffens' point of view, and the instantaneity with which a crime can be reported over the telephone is not the least of its recommendations as a factor in public safety and convenience. It is not to be denied that the police systems of our great cities have already been vastly improved by the adoption of the telephone and by the fact that the public can reach the police office quickly in case of emergency. Calling in the sensational newspapers is perhaps going it a little bit strong, but in seeking publicity the telephone is the best and quickest thing to hand. A case occurred only last week in New England where a manufacturer was called upon the telephone and informed that some one had seen his horse and buggy being driven violently out of town. This put the manufacturer on the alert, and he was not long in recovering his equipage as well as in effecting the arrest of an embezzling clerk who had used it to get away with stolen funds. In this instance the telephone was invaluable and without it the criminal might very easily have escaped. Police Commissioner Bingham seems to have spoken a bit hastily—but he seldom does anything else, according to his critics.

The Telephone and the Grocers

In talking with a grocer, who is energetic and has been fairly successful as a retailer, the subject of telephone orders was mentioned. When asked what proportion of his goods were sold over the telephone, he replied:

"Though most of my business is done over the telephone, those of my customers who come to the store order the most goods. And if those who order over the telephone would come to the store and see the goods, they would order more, for I have seen it tried. They don't know what there is to be had, and do without."

Here is a new phase of the telephone business. An old objection, one which those early in the field had to meet, was that the telephone would tend to extravagance. Telephone orders are in most cases, and of necessity credited, and are not cash transactions. If the good housewife, it was said, does not have to hunt up her dimes and nickels to buy things, but merely order them, she will run up large bills before the end of the month. Now comes testimony on the other side, saying that the telephone tends toward lower grocery bills.

Yet we suspect that the contract agent need not despair of securing new orders from grocers doing a small business, nor of running in an occasional auxiliary trunk to the branch exchanges in the larger establishments. The grocer quoted was behind the times in that he failed to utilize the possibilities in advertising. The telephone, in combination with judicious advertising, has been found to take the place of salesmen, reduce the amount of display space kept at a high rental, and save countless minutes of waiting to customers.

Advance in Wireless Telephony

When the dynamo for the production of alternating currents at an extremely high frequency—Prof. Fessenden's "wave mill"—was invented, experiments in wireless telephony took on new features of interest. With this fundamental part of his system in a settled form, there yet remained many tasks for the patience and ingenuity of the inventor. So large is the entire subject that his present Institute paper, although long, as such papers go, barely touches upon some of the most attractive branches of the general problem which have furnished a field for much special investigation of an extremely intricate and valuable character.

For example, a great deal has been done to increase the current carrying and modulating power of the transmitter; and from another practical, commercial standpoint, the development of an efficient type of relay for connecting wireless terminal apparatus to telephone exchange lines is of the utmost interest.

The present paper, brief as is its consideration of details, summarizes the results of an extraordinary amount of work, and puts us fairly in touch with the front line in this notable field of achievement. The commercial importance of wireless telephony, within certain limited fields which are recognized by the inventor, is likely to be felt at no distant date, and, so important are methods of communication to our social organization that the present discussion will come to be considered as one of the milestones by which we trace the progress of human affairs.

Long Distance Telephone Reporting

This week we are able to publish an article which, we believe, brings out more clearly than anything which has yet been printed the natural advantages of long distance telephone service in the office of the modern newspaper. Before this we have referred to the same subject, and have from time to time chronicled in our pages various advances in plans for the employment of the telephone as a news gatherer. Now we print an article "from the inside," and if a contract agent cannot use this to impress the local managing editor it must be because he does not believe in his own work. It shows that the proper use of the telephone cannot be secured at an instant's notice, but a little practice and planning bring results which far surpass those of telegraphy. The telephone method, instead of being an eminently artificial device, involves no effort less natural than talking, and makes for sharper action on the wire.

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Wireless Telephony*

By R. A. Fessenden.

The types of transmitters most commonly used are the carbon transmitter and static transmitter, and the carbon transmitter relay.

Fig. 5 shows the standard type of carbon transmitter.

It was found that the ordinary carbon transmitter was unsuited for wireless telephonic work on account of its inability to handle large amounts of power. A new type of transmitter was therefore designed which the writer has called the "trough" transmitter. It consists of a soapstone annulus to which are

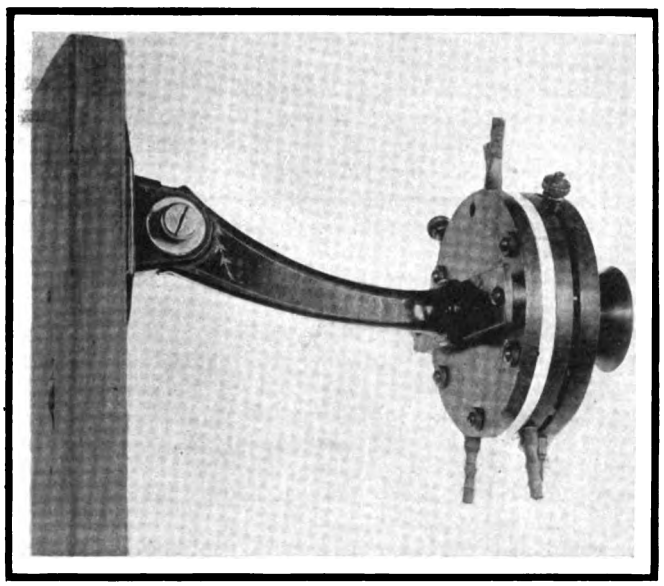

Fig. 5.—The Standard Type of Carbon Transmitter.

clamped two plates with platinum iridium electrodes. Through a hole in the center of one plate passes a rod, attached at one end to a diaphragm and at the other to a platinum iridium spade. The two outside electrodes are water-jacketed.

This transmitter requires no adjusting. All that is necessary is to place a teaspoonful of carbon granules in the central space. It is able to carry as much as 15 amperes continuously without the articulation falling off appreciably. It has the advantage that it never packs. The reason for this appears to be that when the carbon on one side heats and expands, the electrode is pushed over against the carbon on the other side. These transmitters have handled amounts of energy up to one-half horse-power, and under these circumstances give remarkably clear and perfect articulation and may be left in circuit for hours at a time.

Fig. 6 shows a type of condenser transmitter in which the vibration of the diaphragm alters the electrical capacity of the transmitter, thus throwing the circuit in and out of tune or spilling more or less energy through a leakage circuit.

Fig. 7 shows a transmitting relay for strong currents. The only thing noticeable about this is that the telephone magnet is a differential one.

It will readily be understood that where a person in Albany, for example, wishes to talk to another person on board a ship off New York, the wireless station being located near New York, the volume of the transmission received at New York will not be very strong, and while it may be possible to transmit it without amplification, amplification is advisable.

A receiver which is a combination of the differential magnetic relay and the trough transmitter is used for amplifying very feeble currents. An amplification of 15 times can be obtained without loss of distinctness. The side electrodes of the trough are water-jacketed. The successful amplification depends upon the use of strong forces and upon keeping the moment of inertia of the moving parts as small as possible. Amplification may also be obtained by mechanical means, but as a rule this method introduces scratching noises which are very objectionable even though comparatively faint.

Other types of transmitters have also been used, such as liquid jet transmitters, transmitters operating by closing the air-gap in a magnetic circuit, and so changing the inductance of the oscillating circuit, etc.

The transmitting relays are connected in the wire line circuit in the same way as the regular telephone relay, except that in place of being inserted in the middle of the line they are placed in the wireless station and an artificial line is used for balancing. There is no difficulty met with on the wireless side of the apparatus, but on the wire line side there are the well-known difficulties due to unbalancing which have not yet been entirely overcome. For the correction of these difficulties, therefore, we must look to the engineers of the wire telephone companies. At present the difficulties are if anything less than those met with in relaying on wire lines alone.

The transmitter may be placed almost anywhere in the circuit between the arc or dynamo and the antenna, or between the arc or dynamo and ground, or in the transformer circuit, or in shunt to an inductance or capacity, the results obtained in all cases being indistinguishable. The sole criterion of success seems to be that the transmitter should be capable of handling the energy and the circuit should be properly adjusted. Some

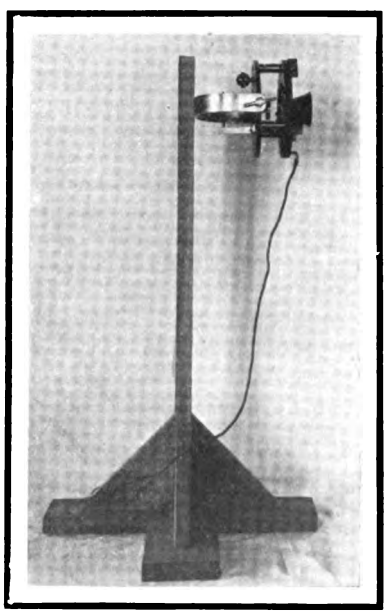

Fig. 6.—Type of Condenser Transmitter Used in Wireless Telephony.

success has also been attained by placing the transmitter in the field of the dynamo, but this method requires very careful designing of the field circuit.

The receiver which the writer has found most satisfactory for general purposes is the liquid barretter. It consists of a fine platinum wire, about a ten-thousandth of an inch in diameter, immersed in nitric acid. Tests made with this receiver show that it responds without apparent loss of efficiency to notes as high as 5000 per second. Some very careful meas-

*Abstract of a paper presented at the 25th annual convention of the American Institute of Electrical Engineers; concluded from issue of July 11, 1908.

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urements recently made by my assistants, Messrs. Glaubitz and Stein, give the following results:

Voltage of high frequency circuit necessary to produce readable signals, 15×10^{-5} volts.

Ohmic resistance of receiver, 2,500 ohms.

Value of high frequency current necessary to produce readable signals, 6×10^{-5} amperes.

Electromagnetic wave energy required to produce audible note for period of one second, 1×10^{-4} ergs.

The telephone used for detecting the signals had a resistance of approximately 1000 ohms. Some measurements were made

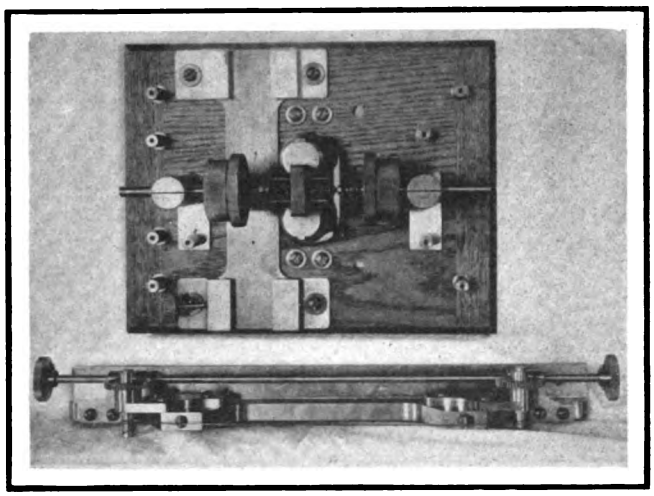

Fig. 7.—Transmitting Relay Used With Strong Currents.

to determine the change of current in the telephone circuit by using a sensitive galvanometer in series with the telephone, but the results obtained were obviously too low, possibly on account of the electrostatic capacity of the turns of the galvanometer with respect to each other.

The above measurements were taken by shunting the barretter across a piece of straight resistance wire in series with a hot-wire ammeter, to determine the voltage necessary, and by introducing resistance in series with the barretter to determine the resistance of the barretter. The figures were also checked in a number of other ways and very concordant results were obtained, so that it is believed they may be relied upon.

The thermoelectric receivers or rectifiers of Dr. Austin and Mr. Pickard, and the vacuum tube receivers of Fleming, De Forest, and Cooper Hewitt also act very satisfactorily. The fact that the writer has not been able to get as good results from them may be due to greater familiarity with the liquid barretter and heterodyne receiver.

Where the wireless telephone is operated by first talking into the transmitter and then throwing a switch and listening, the usual wireless telegraphic connections are used. This has been found in practice to be very inconvenient, however, and several methods have therefore been devised for talking and listening simultaneously, which methods can, of course, also be applied to duplex wireless telegraphy. Among those methods may be mentioned the commutator method and the balance method.

The former method is fairly well known and consists in rapidly connecting alternately the transmitter and receiver. The balance method consists in using a phantom aerial, the circuit having such capacity inductance and resistance as to balance the radiating antenna. The apparatus is shown in Fig. 8.

In order entirely to cut out disturbances in the receiver while sending, an interference preventer is used in the receiving circuit.

It may be here mentioned that balance methods work much better with wireless telephony and telegraphy than with line telephony and telegraphy, for the reason that the radiation resistance of an antenna is absolutely definite and is not affected by the weather, as are line circuits. Consequently, the balance can be made very sharp and once made does not need to be altered. Of course, half the energy is lost, but this is a matter of practically no importance, as the cutting down of the strength of a telephonic conversation to one-half is as a rule hardly noticeable, especially where there are no line noises or distortion of the speech through capacity effects.

The receiving station relay is similar to the transmitting relay. The same remarks apply to its use in connection with wire lines as to the transmitting relay.

As will be realized from the above, the operation of a wireless telephone system is very simple. The operator merely throws his switch to the position for telephoning and talks into an ordinary transmitter and listens in an ordinary telephone receiver. When the duplex method is used, as is always advisable, the conversation proceeds exactly the same as over an ordinary telephone line.

I believe I am correct in saying that the transmission by wireless telephone is considerably more distinct than by wire line and that the fine inflections of the voice are brought out much better. This, I presume is due to the fact that there is no electrostatic capacity to distort the speech, as in the case of wire lines, though I think the effect is also partly due to the absence of telephone induction coils with iron cores. Possibly some of the gentlemen present have witnessed the operation of the wireless telephone transmission between Brant Rock and Plymouth and between Brant Rock and Brooklyn. If so, I think they will bear me out in saying that the transmission was clearer than over wire lines.

As a rule, there is absolute silence in the wireless telephone receiver except when talking is going on, though of course the usual noises may be heard if persons are walking across the room, etc. This makes listening in less of a strain than when talking over wire line. Even during severe atmospheric disturbances the talking is not interfered with to any noticeable extent, provided of course that an interference preventer is used.

A comparative test was made with talking between Brant Rock and Brooklyn by wireless and by wire telephony. The talking over the wire line was done from a long distance station

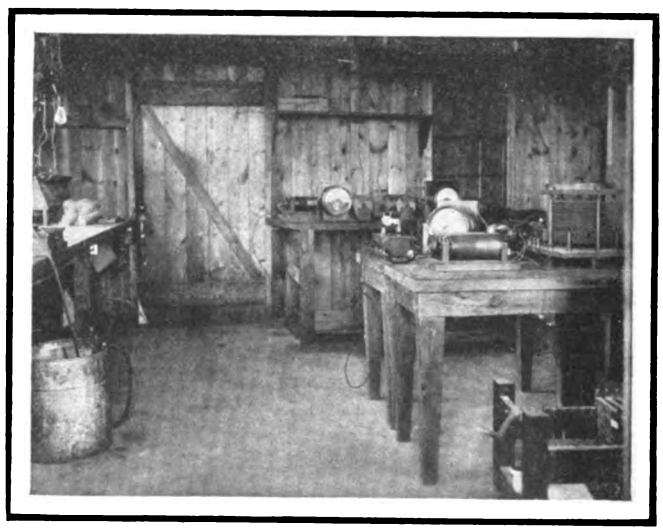

Fig. 8.—Apparatus Used With Balance Method for Talking and Listening Simultaneously.

in Brooklyn. The wireless transmission was considerably the better. The fact that the wire line included in its circuits a cable from New York to Brooklyn was of course a disadvantage, but even allowing for this, practice and theory appear to be in agreement to the effect that transmission by wireless telephony over long distances is better than by wire line.

This method should be of especial value to Independent telephone companies, which have their local exchanges, but no long distance lines, especially since no franchises or rights of way are necessary.

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A Study of Multi-Office Automatic Switchboard Telephone Systems*

By W. Lee Campbell.

In order to illustrate the effect of the annual expenses just discussed at length, caused by dividing a system up so that it employs a number of offices instead of one, the writer has constructed the curves in Fig. 13, which show what the expenses would be for the different numbers and sizes of offices in the hypothetical 10,000-line system used in Figs. 8 and 9. Referring to curve *A* in Fig. 13 it will be noted that the annual cost of central office labor for the nine-office arrangement of the manual system is 80 per cent greater than for the single-office arrangement.

It might be stated just here that the item of operators' hire is one which yearly grows to greater magnitude. One very large telephone operating company instructs its engineers engaged in development studies to estimate on operators' salaries being at least 15 per cent higher 15 years hence.

Curve *B*, Fig. 13, shows that the increase in the cost of labor plus the annual charges on equipment and buildings, weighs heavily against the division of manual systems. In fact, experience shows that where the ultimate number of subscribers that may be expected in an office district within 15 years does not exceed the capacity of a single multiple board (about 10,000 lines) and there is no concentrated group of subscribers at a considerable distance from the best location for a single office, it is generally found that a one-office system will be the most economical when manual equipment is used.

There are conditions under which it is profitable to divide

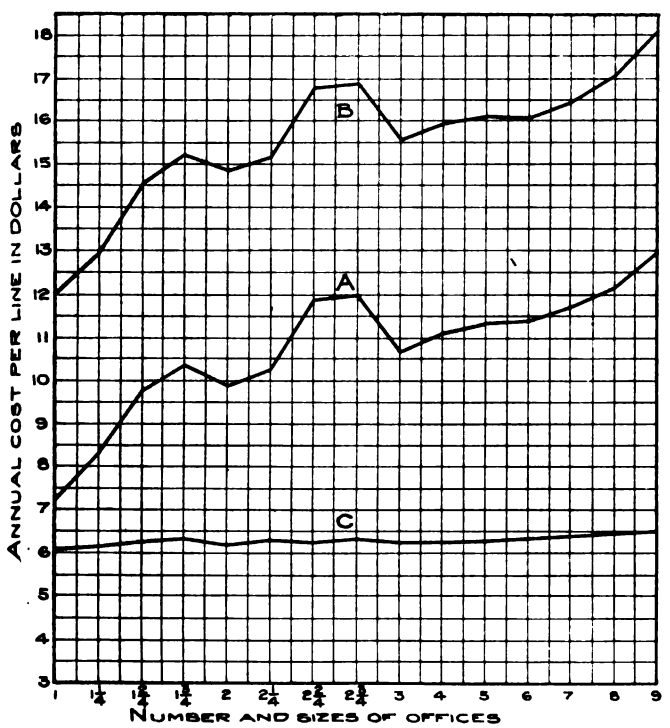

Fig. 13.—Expenses for Different Numbers and Sizes of Hypothetical 10,000 Line Manual and Automatic Systems.

manual 10,000-line plants; that is, there are conditions under which the saving in the annual charges on cable, wire and conduit will more than offset the increase in central office expenses, if division is not carried too far. It is, of course, necessary to make a thorough engineering study of each apparently suitable location for a branch office to determine whether or not any real economy would result; but since the annual charges on subscribers' lines less than two miles long using No. 22 gage cable conductors average about $2.50 per mile, it will be seen that the saving in length of line will be less than the corresponding increase per line per annum in central office expenses (indicated by curve *B* in Fig. 13) except where the lines are comparatively long. Roughly speaking, an economical arrangement of the average divided manual system will include offices not much less than two miles apart.

Curve *C* in Fig. 13 shows that division of automatic systems

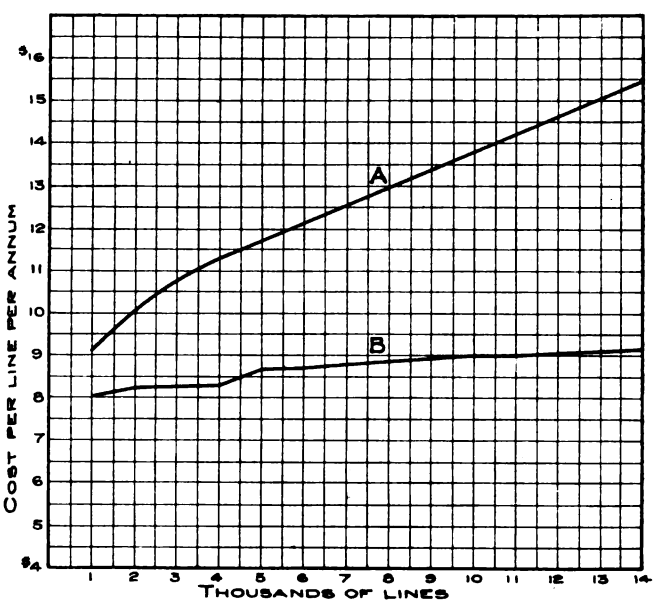

Fig. 14.—Costs per Line per Annum of Manual and Automatic Central Offices and Expenses.

may be profitably carried much further on account of the slow increase in central office expenses resulting from adding to the number of offices.

The writer hopes that he will be pardoned if before leaving the subject of operating expenses he pauses to call attention to curves *A* and *B*, Fig. 14, which include the office expenses as given by curves *A* and *B*, Fig. 12, plus the annual cost per line of clearing line and telephone trouble, and plus the annual charges for interest, depreciation and taxes on one telephone per line.

In calculating depreciation, the life of the telephone for both systems has been taken to be 10 years. It might appear unreasonable at first thought to believe that the more complicated automatic telephone has as long a life as the simpler manual instrument, but experience shows that the parts of a telephone which depreciate most rapidly are those which are handled by the user, knocked and rubbed against by passers-by and mischievous persons; also that the parts which must be kept highly finished, because they are exposed to view, are most quickly affected not only by human contact, but by sunshine, dampness, etc. Consequently, since very little more of an automatic telephone than of a manual telephone is exposed, and since the calling device, which represents about 40 per cent of the value of the instrument, is locked inside the case, where is is subject only to wear and tear of legitimate service, which it will successfully withstand for at least 15 years, the writer has concluded that automatic telephones could reasonably be considered to be longer lived on the average than manual telephones. He

*Abstract of paper presented at twenty-fifth annual convention of the American Institute of Electrical Engineers; continued from issue of July 11.

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has, as already stated, placed the two on the same basis.

The cost of material for repairs and renewals on automatic telephones is a little greater than for the manual. It was found by a thorough investigation that the cost of new parts peculiar to the automatic telephones amounts to 0.14 per cent per annum. This difference has, therefore, been noted in comparing maintenance costs of the two systems in Fig. 14.

The cost of labor for keeping telephones in order is included

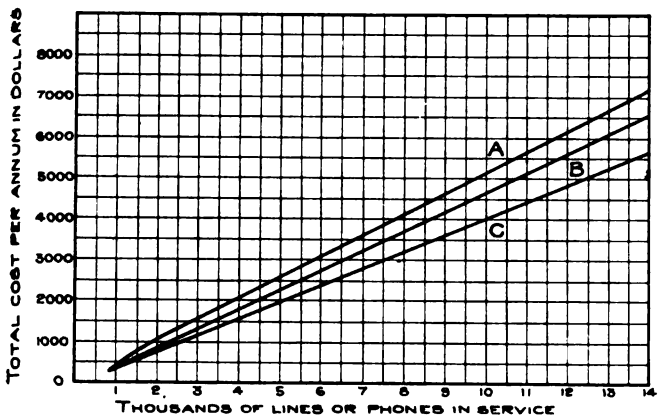

Fig. 15.—Cost of Labor for Clearing; A, Automatic Telephone Trouble in Regard to Telephones in Service; B, Line Trouble According to Lines in Service; C, Line Trouble According to Telephones in Service.

in the curves in Fig. 14 and for automatic telephones is also shown separately in Fig. 15. No insurance on the telephones is included.

Returning to the subject of plant division and its results, there is still another point to be considered, namely, the effect of plant division on service. An investigation of this reveals what is a very serious objection to a multi-office manual system; because slower service, more mistakes by the operators, and, what is most aggravating to a telephone subscriber, more premature disconnections during conversation, are the inevitable results of having connections handled by two operators instead of by one. The good will of the telephone user is something which cannot be lightly considered in these days of keen telephonic competition. Unpopular service is not only a serious handicap in a contest with a rival company, but it also retards growth, invites higher taxes and hostile legislation, and often results in a general clamor for the regulation and reduction of rates. On the other hand, a record of giving service which meets with the general approval of its subscribers is an asset of inestimable value to any telephone operating company, and, in fact, is the best reason for the company's existence. We find, therefore, telephone managers, who are chiefly concerned in pleasing the public, pretty solidly arrayed against having manual systems split up, except where the number of stations is so great or the area covered by the system so large that rates would be excessive if one central office only were used. In fact, "no divided systems," was one of the battle cries of the leaders of the Independent telephone movement which has spread over the country so rapidly and so widely that its present magnitude baffles conception.

Increasing the number of offices in an automatic system does not appreciably affect the service. All calls are trunked anyhow, whether one office is used or many. Therefore, splitting up such a system does not add to the amount of trunking or in any way affect the speed and uniformity of service. The subscriber is not required to change his method of calling or to make more turns of his dial. No more automatic switches are necessary and a connection does not include any more switches in a divided system than in a single office plant. When the writer states that the service of a multi-office automatic system is on a par with that of a single office automatic system, he believes that he gives it the highest endorsement possible in the present state of the telephone art; for the companies operating automatic switchboards have demonstrated beyond question that they can give satisfactory service and furnish any special attention to which patrons of the girl-operated systems have been accustomed. Indeed, telephone users, who have had experience with both, almost universally prefer the automatic service to the manual. This fact is not only attested by all who have made an investigation, but has been publicly affirmed repeatedly in the reports of prominent public servants and engineers. For example, attention might be directed to the address delivered by Mr. Kempster B. Miller, before the International Electrical Congress at St. Louis, in 1904.

Not only has the writer not discovered any reasons which weigh materially against division of automatic systems, but he finds that the saving in the investment in cable, wire, and conduit would be even greater than in a manual system. First, because division may, as clearly shown, be carried much further without seriously affecting central office expenses, and secondly, because the number of trunk lines required for handling traffic between automatic offices is less than between similar manual offices. In other words, an automatic trunk will carry, on the average, more busy-hour calls than a manual trunk.

Curve *A*, Fig. 16, shows the call-carrying capacities which one of the largest manual telephone companies instructs its engineers to use in arriving at the number of trunks needed between proposed offices. As a rule, a manual trunk should not be expected to handle over 15 to 18 calls during the busy-hour even between rather large, well-managed offices; between small offices from 10 to 12 is all that can safely be depended upon. Reference, however, to curves *A* and *B*, Fig. 4, shows that between automatic offices a considerably higher trunk-carrying capacity is experienced. The largest number of trunks per group almost universally used in automatic systems is 10. Therefore, the curves in Fig. 4 are dotted above the line corresponding to 10 circuits per group. With groups of this size a minimum carrying capacity of 22.5 busy-hour calls per trunk is secured. This is a decided increase over the carrying capacity of manual trunks even where the latter are installed in groups of the greatest efficiency; that is, groups of about 73 circuits each. It would rarely, if ever, be possible to obtain such a large group if a manual plant were so divided that all offices were comparatively small, but in almost any multi-office sys-

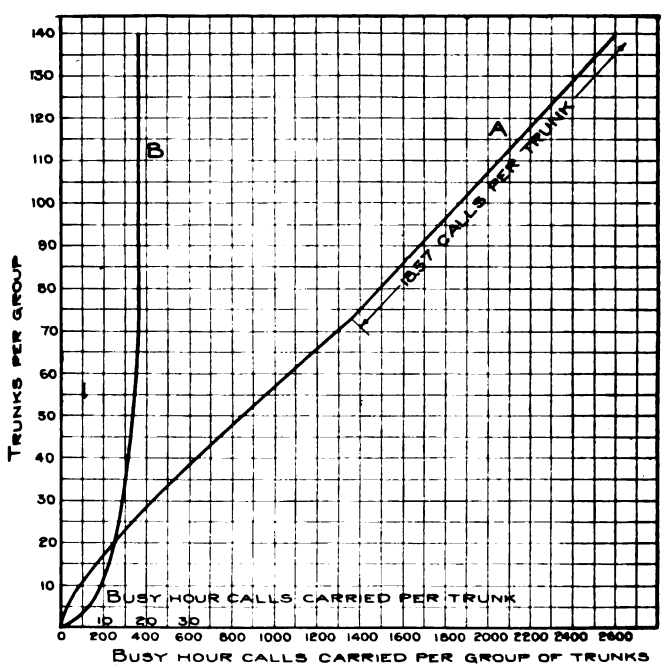

Fig. 16.—Call Carrying Capacities of Manual Trunks; Relation Between Circuits per Group and Busy Hour Calls per Circuit in Automatic Systems.

tem the majority of the trunks between offices can readily be placed in small groups of 10 trunks each. Consequently, in an automatic multi-office system maximum efficiency is secured on nearly all of the trunks. This is illustrated by curve *D*, Fig. 9, which gives the average minimum carrying capacity per trunk for each of the different arrangements of the hypothetical 10,000-line system. The average minimum number of busy-hour

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calls carried per trunk is, according to the curve, about 20.75, and the lowest figure is 19.3 for the nine office arrangement. Supposing that it be practicable to use this nine-office arrangement in a 10,000-line manual system, the average number of busy-hour calls carried per trunk would be about 12.

The small number of trunks that will carry the traffic between automatic offices even in a thoroughly divided system is illustrated by curve *E*, Fig. 9, which shows the ratio on a percentage basis between the number of trunks and the number of sub-

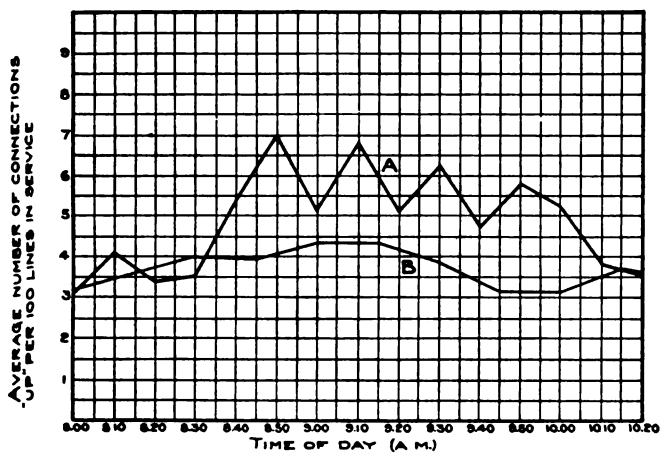

Fig. 17.—Comparison of Connections Up During Busy Hours on a Manual and an Automatic Board.

scribers' lines. With the largest number of offices considered this percentage is but 9.3.

One reason for the increased efficiency of automatic trunks is found in the shorter length of time per connection. In manual practice it has been found that each trunk is occupied on the average at least two minutes per connection, whereas automatic experience proves that during the busy-hour a trunk is not occupied over 83 seconds per average connection. A subscriber to automatic service answers his telephone quicker and generally does not hold the line so long for conversation as does a manual subscriber; also, the disconnection is made much quicker in the automatic system. This feature of the quicker disconnection is especially helpful during the busy hours when manual operators are most likely to be rushed and consequently slow about pulling down connections. The interval of time that elapses between release of a trunk by one automatic selector and seizure of it by another need be, and often is, but a fraction of a second. This, too, helps to increase the carrying capacity of the trunks.

The writer was much interested while studying the efficiency of the trunks of the two systems to note the difference between the number of connections existing at the busiest moment of the day in manual and automatic offices. For example, in the central office of a busy manufacturing city in Ohio a count was taken every day for a week in January of one year to ascertain the maximum number of connections "up" in the various operators' positions at intervals during the busy hours of each day. The results for the busiest day are shown in curve *A*, Fig. 17. A few months after these observations were made the equipment of this office was changed to the automatic type. In the following January, one year after the original data were secured, counts were made every day for one week of the number connections "up" during the busy hours in the automatic switchboard. The results for the busiest day are shown in curve *B*, Fig. 17. It will be noted that the maximum percentage of connections counted at one time on the manual was 7 while on the automatic it was but 4.36. Similar observations were made on a number of automatic plants, and, as already stated earlier in this paper, it was found that in busy automatic offices of 8000 or 10,000 lines, the maximum number of connections counted at the busiest moment did not exceed 4 per cent. In small offices of less than 1000 lines where erratic fluctuations of the traffic are more noticeable the maximum ran up to 4.7 per cent in some instances.

A still higher trunk efficiency could often be secured in automatic systems if the trunk groups could be made larger than 10 lines each without impairing the speed at which idle trunks are selected. This is shown by the dotted portions of curves *A* and *B*, Fig. 4, which give the carrying capacity per group and per circuit for groups up to 28 circuits each. On account of the fact that in an automatic system where the number of offices is comparatively large, and each office is comparatively small, the trunks are generally divided into a large number of small groups, and it is doubtful if there would be anything gained by making the maximum size of a group of trunks between offices greater than 20 circuits. Indeed in such a system many of the groups would contain considerably less than 20 circuits each.

The manufacturers of automatic apparatus have recognized the possibilities of larger groups and are now testing equipment designed to enable them to put more lines in each. Since such equipment has not come into general use, however, it will not be considered further in this paper.

(*To be continued.*)

Independents Take Note—Latest Instructions to Bell Installers!

A plant department man got desperate the other day, tore his hair, perhaps swore—that is, if plant men ever do swear—and said: "O, what's the use?" Then he really got mad and sent in to the *Michigan State Gazette* the following:

"Do your work as slovenly as you can.

"Drive your staples near the edge of the wood so it will split.

"Never heat your soldering iron any hotter than is necessary to just melt the rosin.

"Don't scrape your wire clean for any joints.

"Leave all joints unsoldered, or, better still, wrap tape around it without soldering.

"Don't tighten any connecting screws or nuts, but leave them loose.

"Make all the noise around the subscriber's premises you can or they won't know you are there.

"Promise a subscriber anything he asks for.

"Then wonder why the subscribers 'kick' and the company does not appreciate good work."

When he got back to his desk he sent the office boy on a run for a bunch of vouchers (resignation blanks) and filled them out in favor of anyone who is smart enough to live up to the above rules.

Before Reporting a Receiver Off the Hook the Operator May Ring on the Line

A peculiar trouble was run down by one of the local men in the Springfield (Mass.) exchange lately, says a contributor to *New England Telephone Topics*. People at the station could not hear, and upon examination the receiver cord was found to be wet. The lady of the house said that she had noticed the baby chewing on it for some time, but paid no particular attention to it until suddenly he set up a loud wail. The probability is that that particular baby will let telephones alone, at least until he is old enough to become "one of the kickers."

The Value of the Telephone

A Paris newspaper has been asking its readers to name the 12 greatest inventions. Over 400,000 coupons were sent in and the votes were cast in the following order: The locomotive, the potato, vaccine, the cure of rabies, sugar, electric telegraph, matches, the boiler (of a steam engine), the telephone, petrol, the sewing machine and soap.

The printing machine only captured seventeenth place, the automobile was thirty-first, the typewriter was fifty-fourth and the aeroplane fifty-ninth. The poorness of the telephone service in France accounts probably for the fact that it does not appear higher up the list.

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Experiences in Collecting News by Long Distance Telephone

By John Hammond, *Managing Editor, The Augusta, Ga., Chronicle.*

The operation of the long distance telephone as a news-gatherer has, like all other experiments, had to work itself out. When the Morse telegraph circuit was first established leased wires were an unknown quantity and Mr. Phillips' code an undreamed of possibility; the one followed the other, and the result has been the established press circuit which ranks foremost to-day among the marvelous developments of this age. But, in this connection, the long distance telephone line is yet to be considered.

If the experiment, originated in the *Augusta Chronicle* office some four years ago, has been tried by other newspapers and discarded as impracticable or expensive, the fault has been in the operation and not in the facility itself; the method applied was wrong, not the machinery.

After more than 16 years' experience in handling news matter from a distance, and three years' close study of the telephone as a facility, from time to time developing one small possibility after another, the writer unhesitatingly asserts that the long distance telephone is to-day one of the greatest facilities within the reach of modern newspaper operation, and in the not distant future is destined to stand out distinctly with a marked individuality of its own. For this assertion there are reasons, not theoretical, but practical.

About three years ago, or a little more, a toll terminal was installed for the *Augusta Chronicle* by the Southern Bell Telephone & Telegraph Company, and a stenographer was employed to operate the long distance telephone station in that office. This was found not to be practicable for two reasons: one the double expense, the other the delay in furnishing prepared copy and lack of knowledge of the newspaper business. One could be corrected by time and training, the other could not. Later a local reporter was employed by the paper. He had exceptional ability as a stenographer, but the same experience as in the first instance was a drawback to the service.

I took the matter up as a study, believing that it could be made to work itself out in some better manner, and it has. The result has been the basis for this statement: Where a publication will average anything above 300 words a night from any given point, within reasonable distance—200 or 300 miles—the telephone is quicker, more accurate, less expensive and more satisfactory than the telegraph. The only qualification absolutely necessary for the successful operation of the machinery to demonstrate this fact in any newspaper office is ability to turn out "newspaper copy" at a fairly rapid rate on a typewriter, and understand plain English.

During the recent telegraphers' strike there was occasion to give the long distance telephone line a test in the *Augusta Chronicle* office which perhaps it has never had anywhere else in the country, and which speaks louder for its practicability than any other test made. Among the first offices to "go dead" on the press line was that in the Chronicle Building. In a few minutes the writer overheard a conversation on the telegraph line between Washington, D. C., and Columbia, S. C., where a first-class "press operator" was employed as telegraph editor on the newspaper. Columbia was to get the report from Washington, with a good press man on each end of the wire, despite the strike. It was apparent that the *Chronicle* could not afford to allow itself to be beaten by a neighbor almost within its own territory just because it, by a piece of luck, had a "press man" and the *Chronicle* did not. In less than five minutes the writer had communication with Washington, and gave an order for the press report to be copied at Columbia and relayed to Augusta over the long distance telephone. I took the report myself, and continued to take it for three weeks.

The first night—at least from the hour of the strike, which was about 9 o'clock—until "30" the telephone line was "up with the Washington wire," but did not give complete satisfaction. I worked out, mentally, a number of little time savers, and began to put them into operation when the wire opened the following night. Rather than having the relay operator read his copy spasmodically and with variations, he was asked to strike an even tone of slow conversational form and not stop unless I "broke" him. It covered more ground. On the third night we were working ahead of the Washington wire. The telegraph connection between Columbia and Washington opened at 6 p. m.; the telephone circuit did not open until 7:30 p. m. By 9 o'clock the telephone line had "covered" Washington and had a "let up" of half an hour for copy. This continued until 3 o'clock and at 3:30 the telephone line took "30" in less than five minutes after Washington gave it, and had "covered" every item sent on the wire.

The third night of operation the lapses of time were even greater on the telephone line, the intermissions—"waits for copy"—running at times as much as an hour to allow a sufficient accumulation to keep the circuit from Columbia to Augusta busy, and still the close was, as before, within five minutes of the telegraph line.

These transmissions were not of selected matter of any sort, but the regular run of press copy, and included the full market report of from five to six columns of quotations.

This is but an indication of the possibility of gathering the news over the telephone line. The point equally to be considered in the business office of a newspaper—more frequently the greatest consideration—is that of expense, and it is in this respect that the telephone line has won its way in the experiments made here. The third and fourth night of the telegraphers' strike arrangements were made with certain other points in this vicinity, some of which had tried the telephone transmission and discarded it, by which the press report was relayed over the commercial telegraph lines. When this was done the report was cut, not the full amount of press matter being transmitted to the point of destination. To ascertain just how the telephone line was comparing, as an expense, with the telegraph line under this condition, I selected two points taking the press report from the same relay point sending it to Augusta over the telephone line. From the manager of the telegraph company handling the report I secured a record of what would have been the charge for Augusta for the same press matter which was going from Columbia to Savannah. The transmission to the latter point was through Augusta, and hence a copy of the report would have been made here. The count of words for the fifth night of the strike totaled a toll charge of $32. The same night the toll charge for the telephone line, as used, was less than $15, and the telephone line carried an uncut report in something like three hours' less operating time.

These were records made under a tension, as it were. I have made other tests which develop even more interesting comparisons favorable to the telephone. For instance, during the last baseball season the *Augusta Chronicle's* Columbia correspondent lost out on his baseball report one night, and the fact did not develop until after midnight, when it was impossible to reach him. The *Chronicle* office and the newspaper office in Columbia were connected by long distance telephone and both sides of the box score taken in four minutes.

In the same connection there are a few interesting examples of saving in time in which the telephone has proved incomparable. During the Atlanta riot, for instance, the *Augusta Chronicle* closed its news pages at 4 a. m. and carried in them

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details of the riot and news developments as late as 3:45 a. m., or up to a period of 15 minutes before sending the "last form" to the press room. The press telegraph wires close at 3:30 a. m., and on several occasions the *Chronicle* has featured news items from South Carolina as late as 3:45, and on one or two rare occasions has taken an item as late as 4 o'clock and closed its pages only 15 minutes late on a "hold open" order.

Recently the details of a murder story from Atlanta were carried the morning it occurred, without any delay, while the press wires did not carry that story until the following night, and then in more meagre detail than taken over the telephone line.

The feature of the long distance telephone line, however, is as an advantageous facility in bureau work. The *Augusta Chronicle* maintains a bureau in Columbia and Atlanta. All news matter developing too late for the mails reaching Augusta by midnight is accumulated in the Columbia and Atlanta offices and put on the telephone wire at the "calling hour." A leased wire—telephone—is operated between the *Chronicle's* Augusta office and the offices in Atlanta and Columbia. As a matter of test, records were kept from the Atlanta wire several nights recently, and a comparison made with the telephone and telegraph line, solely to determine the relative cost. The best record was 1560 words in half an hour over the telephone line, the copy being delivered ready for machine room use at a cost of about $1. The same matter over the telegraph line would have been taken at a cost in tolls of very nearly $4, and the copy would have been unedited, and could not have been received in less time than an hour and a half.

Other records about as good have been made, and still there are features in the operation of the long distance telephone line, as a news gatherer, which remain to be worked out from time to time.

Undeveloped Louisiana—A Promising Field for Profitable Independent Telephone Exchanges

By Chas F. Speed, Monroe, La.

It may be stated without the possibility of dispute that the State of Louisiana offers more inducements to the Independent telephone man who may be looking for a location than any other state in the country. The local conditions are such that the Independent movement will be welcomed when it gets a little headway, and this is sure to be at no distant date. The people of Louisiana are in many places firmly convinced that they have been imposed upon more by the company now having almost a complete monopoly than any other state, for the conditions that even now prevail are much the same as were in evidence in other states before the Independent movement started.

In a way, the Railroad Commission of the state controls the rates that can be charged, but the old story of years ago, when a charge at a certain rate was made for the old Blake transmitters and a much higher rate for so-called long-distance transmitters, still holds good in Louisiana. In the country the plantation owner must pay as high as $5 a month or do without a telephone. Dissatisfaction has been created by the spreading of knowledge that different rates for similar service are made to different people, on account of special favors desired by the telephone company.

As to rates that are allowed by the Railroad Commission, the lowest now in vogue in the small towns are $1.65 and $2.50 per month, and from these up, according to the size of the town. In most of the towns in Louisiana the rates are $1.75 and $2.75.

There are not less than 100 towns in the state, each of which would be favorable to the opening of an Independent exchange. These towns range in size from 2,000 to 15,000 population. In every one of them an Independent telephone system will be installed sooner or later, and those who are the first to enter upon the development of these towns will have the choice of the most profitable fields.

As to the local conditions, much can be said in favor of this grand old state, for the day is not far distant when its natural resources will make its citizens wealthy. It has good soil in nearly every section, and in most parts of the state the soil is of the very best. This fertile land produces crops that bring money into the state in great quantities. Cotton, rice, sugar cane and truck gardening all produce crops of great value, and other conditions, such as the presence of natural gas, oil, lumber, etc., will tend, with a continuance of development at the present rate, to make the state very wealthy in a comparatively short time.

As to the climate, which must always be considered when one is thinking of a change of location, it might require many words to offset what has been said or what is thought by the people in other states, but the fact remains that they do not know real conditions. While it gets hot in this country, as in any other Southern state, there is always a cool breeze at night, so that one gets ample rest. As sunstroke is not known in this country, the people actually do not suffer as they do on the hot days in the North, and surely they never freeze to death in winter.

As to the general health of the state, it is significant that Shreveport is reported to have a lower death rate than any place of equal population in the United States, with one exception, and the same general healthful condition exists everywhere in the state.

With regard to the people, it can be stated as a fact that the Louisiana people are among the best to be found anywhere. They are kind, friendly and more than ready to meet one halfway. They have money and spend it freely, and, with few exceptions, pay their bills promptly. To illustrate this, the writer can give his personal assurance that there are not less than 100 subscribers on the Home telephone system in Monroe who pay yearly in advance for service. Another hundred or more pay quarterly in advance.

It should be stated for the benefit of prospective investors that any people desiring to build exchanges in any of the many towns which are open for development should bring their money with them. Bonds do not sell in Louisiana, although it is possible to sell some stock. The reason for this is that it is not at all difficult to get 8 or 10 per cent on any money one may have to loan.

Good Insurance

The Birmingham *Eccentric*, of Birmingham, Mich., says the *Michigan State Gazette*, reports another case where a telephone can save a man the loss of his property. Recently the dwelling of Mr. German, one of our rural subscribers, took fire. When he discovered that his house was on fire he did the most sensible thing in the world—he called up the operator and told her to notify his neighbors while he did what he could until assistance arrived. In speaking about it he grows enthusiastic. "Why, inside of 10 minutes every neighbor from a quarter of a mile to a mile was right there to help me put out the fire, which we did. Enough of my neighbors came so that we could have saved everything by carrying out the goods. I was glad to have them; you bet they all had my hearty thanks. Say, if nothing only for fire protection, I wouldn't go without my telephone. No farmer has any business going without one, for it is one of the modern necessities. With it you are in close touch with your neighbor, doctor and all."

Squirrel Makes Trouble in Cable Box

The Central Union Telephone Company had been troubled for some time with its system in the eastern part of Akron, Ohio. Linemen who were sent out to find the cause of the trouble discovered that a squirrel had worked her way into a cable box, and made a nest there. Several little squirrels were found in the nest. The Board of Public Service was notified and one of the park men removed the squirrels to the park. The trouble was caused by the insulation being gnawed from the wires.

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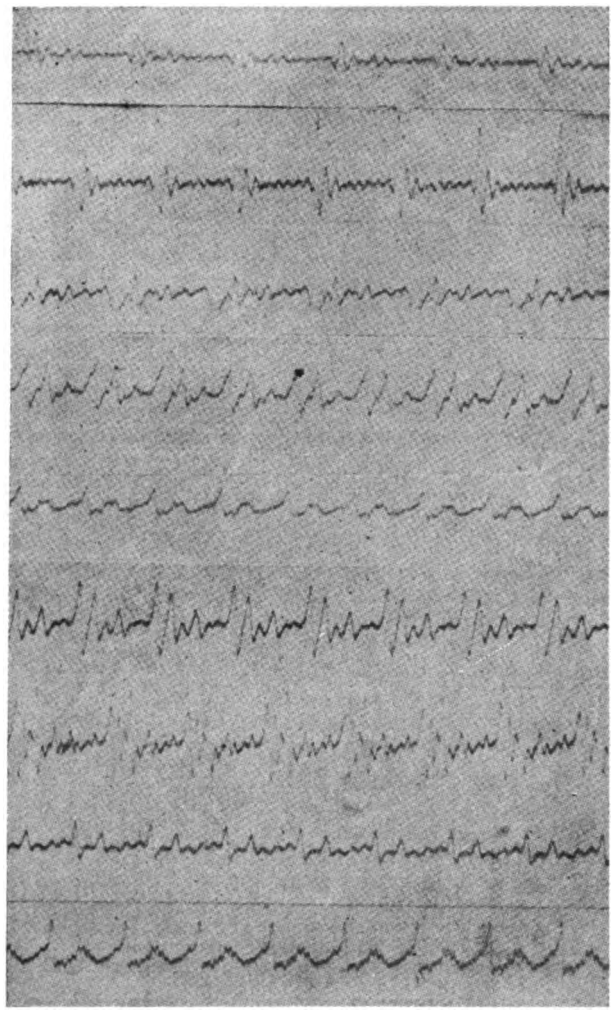
Oscillograms of Telephonic Wave Forms Corresponding to European Vowels*

By Béla Gati

It is only in very recent times that methods of measuring telephone currents have been worked out. Thus it happens that oscillographic records have been made only during the past few years. Most of the work in this connection has been done by English experimenters, such as Duddell, Shepherd and Cohen. To this circumstance must be ascribed the fact that all of the early records so far published reproduced only English vowels, which, of course, are different from those in Continental languages.



Oscillograms of Electrical Waves Corresponding to European Vowels.

The following oscillograph curves made by me are intended to reproduce the records made by the vowels as they are pronounced on the Continent. The speaker was my assistant, Mr. H. Tolnai.

My measuring instrument consisted of a Siemens-Blondel oscillograph with a Berliner transmitter placed in a 2-volt circuit. The primary current was transformed with an ordinary induction coil, and the transformed current was sent through a non-inductive resistance of 3000 ohms. No condensers were placed in the circuit.

The accompanying illustration shows the curves obtained, from which it will be seen that their integral value starting from zero is variable. The positive and negative portions of the curves are not equal, so that the solution of the individual harmonic motions is rather difficult and laborious.

The vowel *e* is the sound of *e* as in the German word "er." *É* is the sound of *e* as emitted with the open mouth and throat in the high German pronunciation of the first syllable of the word "Seele." The great current area of the vowel *O* is very surprising; this was confirmed by barretter measurements. *I* and *ü* have practically the same form.

*Reprinted from *Zeitschrift für Schwachstromtechnik.*

Improving French Telephone Service

It is announced that the Paris telephone service is to undergo further improvements. The administration has decided to ask the Chamber of Deputies for a credit of 42,000,000 francs for the construction of five new exchanges in the city. Nine million francs will be spent on new interurban lines.

The *Figaro* tried recently to effect an improvement in the notoriously bad telephone service of Paris by publishing the telephone number of the Under Secretary of Posts and Telegraphs, and advising everybody who was dissatisfied with the service to complain to him. The readers of the paper hastened to follow this advice, with the result that the telephone girls, unable to distinguish their calls from those of the under secretary's friends, were overwhelmed.

The first complaints started at 7 o'clock in the morning. The under secretary, not having read the *Figaro,* unsuspectingly answered the call himself. From then on until Wednesday over 1300 calls on 525.59 were registered, when orders were given to suspend all calls on that number, the under secretary hastily taking a new number, which is given only to the initiated.

A New Telephone Swindle in Johnstown, Pa.

A new fraud has been worked by the aid of the telephone. Local newspapers report that a prominent physician who happened to drop into a harness shop found registered against him an account for six bits. It turned out that somebody had called up the harness shop by telephone, representing himself to be Dr. Sadler, and said that he wanted delivered to his messenger six bits, from which he would like to select three. None of the bits were ever returned and the swindle was not discovered until the doctor visited the shop himself and was made aware of the charge. A local feed firm in Johnstown has recently been swindled in the same manner.

A Remarkable Trouble

Mr. W. J. Kibbe, the manager of the Interlake Telephone Company, at Canandaigua, N. Y., had reported to him recently a trouble of a rather unusual type.

In a magneto telephone poor talking was reported, and when the instrument was tested it was found that a vagrant screw was held suspended by magnetism from one of the bottom screws holding the generator in place. The lower end of the screw just touched the zinc terminal of one of the dry batteries in the set and thus caused a cut-off in the receiver circuit.

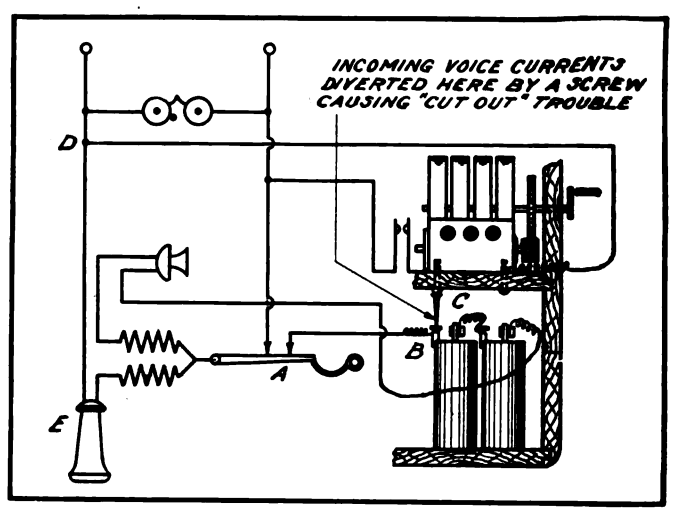


Diagram Showing How a Loose Screw Disabled a Telephone.

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The New Indianapolis Franchise

The Board of Public Works at Indianapolis, Ind., has recommended for the Indianapolis Telephone Company a new franchise which provides for increased rates calculated to produce 7½ per cent return on investment, after taxes and operating expenses are paid. The rates are slightly in advance of those proposed by the civic committee, being $54 for direct line and $32 for two-party line business service and for residence service, $30 a year for direct line, $24 for two-party line and $20 for four-party line service. Provision is made for a discount of 50 cents each quarter for payment within 10 days, and for advances with increased development.

Suit is still pending to declare the lease of the Indianapolis Telephone Company from the New Telephone Company void, but nothing is likely to come of it. There has also been drawn up a contract containing the terms under which the Indianapolis Telephone Company is willing to enter into a consolidation arrangement so urgently desired by the Central Union Telephone Company. It is understood, however, that the terms of this agreement are not entirely satisfactory to all parties interested, and that there is little likelihood that a consolidation will be effected. The new franchise is now in the hands of the Council committee, to which it was referred by that body on its receipt from the Board of Public Works.

The telephone situation in Indianapolis continues to be the subject of active discussion. Since the report of the experts was received, including the financial report, of which we present an abstract in the accompanying tables, the general sentiment has grown very much in favor of the Independent companies. The belief has been more frequently expressed that they have not only wrought a great public benefit, but that, in spite of the fact that they have been paying dividends on a certain amount of "water," they have intended to treat the public fairly. Certain members of the civic committee which investigated the companies object to certain clauses in the modified franchise, but their objections are based on minor points.

With regard to the consolidation proposition, one of the most interesting statements made is that of Joseph T. Elliot, president of the Board of Public Works, who stated that "no argument that I have heard has convinced me that a monopoly in the telephone is the best thing for Indianapolis or any other city of the same population. I believe that competition is the best thing for Indianapolis as a whole, and no advantage would be gained by consolidating the two companies, but, in my opinion, it would be a dangerous proposition."

The results of the investigation, referred to in last week's issue, are summarized in the following tables, showing the assets and liabilities on March 31, 1908, the income account, and all stocks, bonds and unclipped coupons issued, and their disposition to March 31, 1908.

Assets and Liabilities March 31, 1908.

ASSETS (As per Books).

Plant	$1,746,923.69		
Real estate and building	63,554.93		
New building	7,510.42—	$1,817,989.04	
Deduct—			
Donation stock—charged real estate and buildings	$12,350.00		
"Services"	283,157.00		
Discount (donation stock and discount on bonds)	381,180.00		
Unclipped interest coupons on third mortgage bonds	18,750.00—	695,437.00	
Plant, real estate and buildings before deduction of depreciation		$1,122,552.04	
Deduct—			
Company's reserve for depreciation		126,665.98	
Plant, real estate and buildings after deduction of discount, services, donation stock, unclipped interest coupons and depreciation			$995,886.60
Donation stock, "services," discount, unclipped interest coupons, etc.		695,437.00	
Deduct—			
Unclipped interest coupons charged against income		18,750.00—	676,687.00
Cost—Cumberland plant, as per books			2,077.79
Cost—Broad Ripple plant, as per books			7,997.32
Cost—New Augusta plant, as per books			23,424.09
Cost—Claremont plant, as per books			5,760.34
Cost—Furniture and fixtures, as per books			2,655.98
Investments—			
New Long Distance Telephone Company bonds at face value		$145,000.00	
New Long Distance Telephone Company stock, 60 shares; Indianapolis Telephone Company stock, 30 shares (at cost)		3,000.00—	148,000.00
Notes and accounts receivable			
Notes		$311.84	
Miscellaneous accounts		979.99	
Telephone rentals		33,207.57	
		$34,499.40	
Less: Reserve for bad and doubtful accounts as set up on the books		22,170.35—	12,329.05
Inventory of materials and supplies—			
Warehouse supplies		9,922.91	
Tools		1,117.21	
Stationery supplies		347.77	11,387.89
Interest accrued on notes receivable			27.43
Unexpired insurance			2,831.01
Franchise tax paid in advance as per books			2,768.51
Interest accrued on investments			1,875.00
Coupon account (cash on deposit) per contra			1,075.00
Cash on hand and in bank—			
In bank		1,470.10	
Petty cash		1,000.00	
Cash items		3.04—	2,473.14
Total assets			$1,897,255.58

LIABILITIES (As per Books).

Capital stocks—			
New Telephone Company (authorized issue $400,000.00)		$400,000.00	
Less: Treasury stock (H. C. Stifel, trustee)	$5,000.00	$395,000.00	
Indianapolis Telephone Company cumulative preferred (authorized issue $800,000.00)		100,100.00	
Indianapolis Telephone Company common (authorized issue $400,000.00)		400,000.00—	$895,100.00
Bonds—New Telephone Company—			
First mortgage, second series bonds	$500 000.00		
Second mortgage (first consolidated mortgage)	300 000.00		
	$800,000.00		
Less: Second mortgage (first consolidated mortgage) bonds in treasury	39,000.00	$761,000.00	
Third mortgage bonds		150,000.00—	911,000.00
Unclipped coupons on third mortgage bonds			18,750.00
Notes and accounts payable—			
Notes		$205,701.84	
Accounts		10,092.18—	215,794.02
Wages accrued			4,979.64
Taxes accrued			14,664.10
Interest accrued—			
On notes payable		$2,244.90	
On bonds		9,512.50—	11,757.40
Rental for telephone system accrued			5,925.00
Accrued dividends on cumulative preferred stock of the Indianapolis Telephone Company			18,018.00
Bond coupons unpaid (see contra)			1,075.00
Deficit			199,807.58
Total liabilities			$1,897,255.58

NOTE—The minutes of the directors' meeting of Oct. 19, 1907, authorized the purchase from the American Automatic Telephone Company of a switchboard for $160.000.00. This sum would, therefore, appear to be an additional liability to the foregoing.

Australia to Admit Telephones and Supplies Without Duty

It is stated that in the recent amendments in the Australian tariff, telephones, telephone switchboards and appliances appear as being admitted free.

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INDIANAPOLIS TELEPHONE COMPANY.	Year ending March 31, 1905.	Year ending March 31, 1906.	Year ending March 31, 1907.	Year ending March 31, 1908.
Gross Income—				
Telephone rentals	$261,584.78	$307,553.50	$317,997.39	$312,891.45
Tolls	10,789.31	14,563.55	13,566.70	11,716.12
Miscellaneous earnings	681.74	1,955.19	4,818.18	2,426.56
Postoffice site	.....	.....	.....	.....
Investment earnings	.....	.....	.....	7,281.24
Gross income as per books	$273,055.83	$324,072.24	$336,382.27	$334,315.37
Expenses as per books—				
Maintenance	$60,570.24	$86,466.21	$84,808.64	$38,574.79
Operation	42,036.94	59,237.43	73,036.15	63,772.08
General—				
Franchise tax	6,534.50	9,086.50	12,683.50	11,609.00
Property taxes	10,350.92	15,339.78	11,775.35	13,765.31
Miscellaneous	46,133.86	64,448.51	72,131.76	73,601.78
To charge off uncollectable rentals	.....	19,364.73	12,610.91	.....
Estimated loss on telephones taken out	.....	17,000.00	12,810.00	10,374.00
To charge off New Telephone Company account	.....	5,748.99	.....	.....
To charge off petty ledger accounts	.....	3,412.55	.....	.....
Depreciation on plant and equipment	.....	52,000.00	50,030.14	103,170.12
Depreciation on furniture and fixtures	.....	.....	3,789.15	295.11
To charge off difference between inventory and book value of material in warehouse	.....	.....	.....	4,561.81
To correct error charging interest to construction	.....	8,440.52	.....	.....
Total expenses	$165,626.46	$340,545.22	$333,675.60	$319,724.00
Net income as per books	$107,429.37	*$16,472.98	$2,706.67	$14,591.37
Bond interest, including that charged to construction and that included in investment earnings, assigned to proper years, less $5,843.76 included in investment earnings	46,026.40	46,872.23	39,354.42	47,140.97
Surplus (deficit*)	$61,402.97	*$63,345.21	*$36,847.75	*$32,549.60
Dividends—				
On New Telephone Company stock	$23,473.50	$21,725.00	$23,700.00	$23,700.00
On Indianapolis Telephone Company common stock	10,786.59	2,739.07	.....	.....
On Indianapolis Telephone Company cumulative preferred stock	4,325.83	6,006.00	6,006.00	6,006.00
Total dividends declared and accrued	$38,585.92	$30,470.07	$29,706.00	$29,706.00
Net surplus (*indicates deficit)	$22,817.05	*$93,815.28	*$66,553.75	*$62,255.60

NEW TELEPHONE COMPANY	Year ending June 30, 1900.	8 months ending Feb. 28, 1901.	Year ending Feb. 28, 1902.	Year ending Feb. 28, 1903.	Year ending Feb. 28, 1904.	Month of March, 1904.
Gross Income—						
Telephone rentals	$83,182.45	$78,036.12	$135,848.89	$166,651.30	$217,934.29	$2,042.07
Tolls	733.85	2,520.76	6,074.56	6,770.88	8,722.88	885.64
Miscellaneous earnings	623.90	1,134.27	.....	199.42	489.81	16.75
Postoffice site	.....	.....	.....	8,538.09	.....	.....
Investment earnings	.....	.....	.....	.....	.....	.....
Gross income as per books	$84,540.20	$81,691.15	$141,923.45	$182,159.69	$227,146.98	$2,944.46
Expenses as per books—						
Maintenance	$21,365.32	$11,458.87	$20,904.25	$25,509.82	$35,134.10	$3,420.13
Operation	13,322.37	9,909.49	17,574.23	23,948.55	30,491.13	2,606.22
General—						
Franchise tax	6,000.00	4,000.00	6,000.00	6,000.00	6,000.00	500.00
Property taxes	2,970.64	2,756.29	5,464.81	7,344.13	7,973.78	664.48
Miscellaneous	39,615.47	24,521.35	31,922.68	25,008.67	42,719.36	4,452.30
To charge off uncollectable rentals	.....	.....	.....	.....	4,649.35	.....
Estimated loss on telephones taken out	.....	.....	.....	.....	.....	.....
To charge off New Telephone Co. account	.....	.....	.....	.....	.....	.....
To charge off petty ledger accounts	.....	.....	.....	.....	.....	.....
Depreciation on plant and equipment	.....	.....	.....	.....	.....	.....
Depreciation on furniture and fixtures	.....	.....	.....	.....	.....	.....
To charge off difference between inventory and book value of material in warehouse	.....	.....	.....	.....	.....	.....
To correct error charging interest to construction	.....	.....	.....	.....	.....	.....
Total expenses	$83,273.80	$52,646.00	$81,865.97	$87,811.17	$126,967.72	$11,643.13
Net income as per books	$1,266.40	$29,045.15	$60,057.48	$94,348.52	$100,179.26	*$8,698.67
Bond interest, including that charged to construction and that included in investment earnings, assigned to proper years, less $5,843.76 included in investment earnings	25,110.40	14,560.54	29,787.50	35,187.65	36,880.56	3,095.83
Surplus (deficit*)	*$23,844.00	$14,484.61	$30,269.98	$59,160.87	$63,298.70	*$11,794.50
Dividends—						
On New Telephone Company stock	$648.00	$432.00	$648.00	$14,645.00	$23,378.00	$2,123.00
On Indianapolis Telephone Company common stock	.....	.....	.....	.....	.....	.....
On Indianapolis Telephone Company cumulative preferred stock	.....	.....	.....	.....	.....	.....
Total dividends declared and accrued	$648.00	$432.00	$648.00	$14,645.00	$23,378.00	$2,123.00
Net surplus (*indicates deficit)	$24,492.00	$14,052.61	$29,621.98	$44,515.87	$39,920.70	*$13,917.50

Statement of the Income Accounts of the Indianapolis and New Telephone Companies.

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	NEW TELEPHONE COMPANY.				INDIANAPOLIS TELEPHONE CO.		
	STOCKS.	BONDS.			STOCK.		
	Authorized $400,000.	First Mortgage, First Series, $300,000.—Second Series, $500,000 (including reissue of second mortgage or first consolidated mortgage for the first mortgage bonds)	Third Mortgage, $15,000 (were exchanged for a like amount, face value, of New Long Distance Telephone Company bonds)	Unclipped Coupons on Third Mortgage Bonds, $18,750.	Preferred, Authorized $800,000.	Common Authorized $400,000.	Totals
Cash received	$91,598.00	$455,309.89	.....	.....	.....	$200,000.00	$746,907.89
Charged "Services" account	5,622.00	77,535.00	.....	.....	.....	200,000.00	283,157.00
Stock donated and discount on bonds	273,500.00 18,000.00	101,900.00	.....	.....	.....	.....	393,400.00
Commission and dividends guaranteed	3,780.00	.. ..	.....	.....	.....	.....	3,780.00
Cost of real estate	1,300.00	.. ..	.....	.....	.....	.....	1,300.00
Bonus—25 per cent. on sale of common stock of Indianapolis Telephone Co.	.....	.....	.....	.....	$100,100.00	.....	100,100.00
Merchandise notes paid	.....	92,975.81	.....	.....	.....	.....	92,975.81
Notes paid for bond interest	.....	26,917.32	.....	.....	.....	.....	26,917.32
Miscellaneous notes payable	.....	1,051.09	.....	.....	.....	.....	1,051.09
Accrued interest	.....	1,903.60	.....	.....	.....	.....	1,903.60
General expense and salary	.....	3,407.29	$5,000.00	.....	.....	.....	8,407.29
Coupon interest charged construction	.....	.....	.....	$18,750.00	.....	.....	18,750.00
Legal services	1,200.00	.....	.....	.....	.....	.....	1,200.00
In treasury	5,000.00	39,000.00	145,000.00	.....	.....	.....	189,000.00
Total issued	$400,000.00	$800,000.00	$150,000.00	$18,750.00	$100,100.00	$400,000.00	$1,868,850.00

Statement of Stocks, Bonds and Unclipped Coupons of the New and Indianapolis Telephone Companies.

Uniformity in Rural Rates and Switching Fees

The South Dakota Independent Telephone Association, at its last annual convention, took action intended to promote uniformity in rates on rural telephone lines, and in switching fees for lines entering town exchanges. Reference was made to this matter in a communication published in our issue of April 11, 1908, and we are indebted to Dr. E. R. Buck, secretary of the association, for further information, as follows:

"At the convention it was found that rural rental charges and switching fees were not uniform throughout the State, and it was decided to appoint a committee to investigate the subject and make up a table of rates which in their judgment was fair and remunerative.

"It was found that rural telephones were being rented at from $18 per year down to $10. Most of the companies were getting $15, which seems to be the popular price in South Dakota. The companies receiving less than $15 did not think they were making much on their rural telephone service.

"It was agreed by all that in the exchanges operating the larger number of telephones it cost more to operate per telephone and they should therefore receive more rent for rural telephones than the smaller exchanges. The rates agreed upon are as follows: Companies operating between 300 and 400 telephones (including both town and rural) giving day and night service, $18 per year, and if paid in advance $15; companies operating over 400 telephones, giving day and night service, $20 per year, and if paid in advance $17; companies operating less than 300 telephones and not giving night and Sunday service, $15 per year.

"Many of the rural lines are owned by the farmers themselves, and connections are switched by the commercial companies operating the exchanges in the towns. It was found that this switching was being done at rates of from $2.50 to $6 per telephone per annum, the exchanges charging these amounts and treating them exactly as lines of their own subscribers, except that the lines are kept up by the owners.

"Most of the companies were receiving $3 per annum for this work. Many of the exchange managers expressed the opinion that the actual cost of doing this switching is not much less than $4 per annum where Sunday and night service is given, and that rates less than that are the same as a gift to the rural line owners and involve a loss to the exchanges. Many of the farmers throughout the State, however, think that any money received by the exchanges for switching is clear gain to them, and they back up this statement with the argument that the operator would have to be kept at the board anyway, and that the operator might just as well do this work as to be idle. The committee recommended the following rates: Companies operating not over 200 telephones and not giving night and Sunday service, $3.50 per annum, per telephone; companies operating between 200 and 400 telephones, not giving night and Sunday service, not less than $4.50 per telephone per year; companies giving night and Sunday service, not less than $5 per telephone per annum; companies operating over 400 telephones, giving night and Sunday service, $6 per telephone per year, or $5.50 if paid in advance.

"As you suggest in your letter to me inquiring about this matter much good might come through a thorough discussion of these questions, and we should all be glad to see it taken up in your columns.

"The owners of farm 'Mutual' lines are getting entirely too much service for the money they are paying for it, and this condition is bound to affect the town exchanges when their local subscribers begin to demand the same treatment that is accorded to the farmers.

"I know of several localities where the farmers are getting free service to five or six towns, and are only paying one switching fee of $3 per telephone for this service. It goes without saying that the service which can be given at this rate without loss is decidedly bad."

More Telephone Litigation at Paducah

It was recently considered in Paducah, Ky., that the City Council would pass a new franchise for the East Tennessee Telephone Company and thus end litigation which has been pending for two years. At a recent meeting, however, the vote was six to five against the franchise. It is said that the reason for the defeat of the franchise ordinance is the belief that the rates stated therein were excessive.

Lafayette Company Installs Hotel Branch Exchange

The Hotel Lahr at Lafayette, Ind., has recently installed a new private branch exchange with 160 telephones. This system is connected with the lines of the Lafayette Telephone Company (Independent).

Not only are telephones provided in the bed-rooms, but circuits are furnished in the dining-room with which connections may be made with the portable telephones equipped with plugs.

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Practical Questions and Answers*

Transmission on a Long Distance Metallic Line of No. 8 Iron Wire (1038)

Will you kindly advise me through your journal what is the trouble with our telephone line? It is a metallic line, of No. 8 iron wire, extending a distance of 435 miles, transpositions cut every half mile, is brand new with all joints soldered, the equipments consist of Stromberg-Carlson instrument style 590, 5 bar generators with 2,000 ohm ringers.

So far we have only been able to use it about half way by cutting it in the center, and then it works unsatisfactorily. A telegraph wire on the same pole parallels it the entire distance. Seven stations on line.

The lines seems to be no more noisy than some of the short lines in this part of the country, ranging from 50 to 75 miles, but the transmission is no good whatever, being entirely unable to distinguish a voice at a greater distance than half way of the line, and it will ring only about half the entire line; they can use either end of the line from the center in either direction at times fairly good. We have tried putting both wires into one binding post and using the telephone as a grounded line. The transmission was some better when arranged that way, but more noisy, and could hear no further.

It is impossible, in the present state of development of the telephone art, to talk a distance of 435 miles on No. 8, B. W. G. iron wire, B B grade, having an ohmic resistance of 14.53 ohms per mile. A full explanation of the reasons for this cannot be given in an answer to a query. Your line is doubtless in good physical condition and properly transposed, but the efficiency of transmission is fundamentally dependent upon the electrical properties of the circuit. High efficiency is secured by low resistance, low static capacity, high inductance and high insulation; the efficiency is increased as the resistance is decreased, the static capacity decreased, the inductance increased and the insulation increased. The seven intermediate stations on the line lower the efficiency, but to what extent cannot be stated without fuller knowledge of the conditions.

Theoretically, the use of the two-line wires in parallel, with an earth return, will give little if any better results, and the line will be noisy because it is not and cannot be transposed. Grounded circuits are unsatisfactory for general telephone service and their use is surrounded with rigid limitations.

There are naturally some differences of opinion as to what constitutes a satisfactory commercial volume of transmission. For toll service few engineers will recommend a standard poorer than the equivalent of 30 miles of No. 19 B & S gage cable, having a mutual static capacity of .054 microfarads per mile. Some toll standards are better than this, and for local service it is very important to provide a better standard. For your purposes, however, this standard is doubtless good enough. The extreme length of such a cable circuit over which it is possible to converse, using powerful magneto telephone sets so erected as to be remote from all noises and extraneous disturbances, is about 60 miles, and this requires that the persons conversing be expert in the use of the telephone and that they elevate their voices considerably. Such a limit of volume is approximated by what you get when you attempt to converse over one-half of your line, or about 220 miles. To obtain transmission as good as the 30-mile cable standard, you cannot converse over your No. 8 iron circuit for a distance exceeding 135 miles. The same volume of transmission over a 435-mile line would require a copper metallic circuit, each wire weighing about 200 lb. per mile, assuming that there is no cable in the circuit and that there are no intermediate telephones. The resistance per mile of a 208-lb. copper wire, at 75° Fahr., is 4.20 ohms, which bears a ratio of 0.29 to the ohmic resistance of your No. 8 iron wire.

The possible means of improving your transmission under present conditions are the use of load coils, the use of repeaters and the use of the most powerful transmitters obtainable. Load coils are not available because of patent rights yet unexpired. The transmission equivalent of your present line is about 100 miles of No. 19 gage cable, and we should not expect that the use of any repeaters which can be obtained to-day and the use of the most powerful commercial transmitters, would reduce the equivalent to anything like what is permissible, even for the poorest of commercial service. We are of the opinion that you must abandon the attempt to talk between terminals or over distances exceeding 200 miles at the extreme. We would not recommend No. 8 iron wire for circuits exceeding 135 miles, under commercial conditions.

*Replies to queries designated by an asterisk (*) are furnished by Arthur Bessey Smith, Asst. Prof. of Telephone Eng'g, Purdue University.

Clearing-Out Drop Trouble—The Series-Bridging Drop (1039)*

I have a magneto switchboard equipped with 1000 ohm clearing-out drops. Almost all the telephones in the exchange are series, with 80 ohm bells. Some people have trouble about ringing off. It seems to be especially bad when we have a farmers' line connected to a town line, and the farmer tries to ring off. Can you tell me how this is and what can be done to help it?

I have also a couple of party lines in town where I am using two series telephones bridged on the same line. They ring each other and central O. K., but other lines can not ring off when connected with them except at times.

Your trouble is due to the relatively high resistance of the clearing-out drop. When the ringing current comes to the cord, it has two paths, the drop, 1000 oms, and the line, 80 ohms plus a little line resistance. Most of it goes by the line and 80 ohm

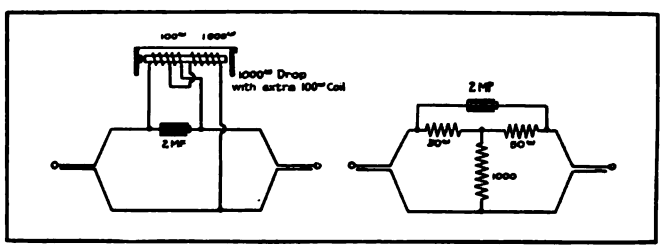

Fig. 1039.

bell. To remove the automatic shunt from the hand generator of each series telephone will help matters. This virtually makes the resistance of the telephone higher, and may be enough to do the business. A better plan is to install clearing-out drops like that shown at the left of Fig. 1039. An extra coil, 100 ohms, is wound on the core. The center of this winding is tapped out and connected to one end of the 1000 ohm coil. Remaining connections are as shown. In the right hand diagram of the same figure is shown the simple scheme on which the winding is based. There may be a very low resistance beyond the drop, in which case the low resistance coils in series get strong current and operate the drop. The condenser allows talking current to flow around with little or no loss.

Running Wires Through Damp Floors (1040)*

We have had some difficulty from damp floors, where our house wires run through them. We formerly used annunciator wire, but it got into trouble very quickly in such places. We have commenced using rubber wire No. 19, in twisted pairs, but still we have had some trouble at wet floors. What shall we do?

A lead through a damp or wet floor needs special insulation, much more than the ordinary run of wiring. It will not pay to buy and use for all the work the grade which will stand any and all wet floors. Use ordinary rubber covered wire, but tape heavily with *rubber* tape for 6 in. or 12 in. above the floor and as much or more below. Make a hole in the floor big enough to allow of pulling this taped wire through without tearing the tape. To protect it from brooms, mops, etc., cover it with molding. Circular loom is excellent for passing through floors, as it affords both insulation and mechanical protection. It needs to be taped at both ends and strapped to the woodwork.

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Telephone News

A. C. Lindemuth Resigns Presidency of the International Association

Mr. A. C. Lindemuth, at a recent meeting of the Executive Committee of the International Independent Telephone Association, presented his resignation from the office of president of that organization and it was accepted. It is understood that this resignation was offered as the result of the signing of a contract providing for certain plans for joint operation between the Richmond Home Telephone Company, of which Mr. Lindemuth was president, and the Central Union Telephone Company. Mr. Lindemuth also resigned from the presidency of the Richmond Home Telephone Company.

It is understood that he has been retained by the Executive Committee of the International Association as counsel to prosecute certain proposed suits to prevent illegal consolidations or mergers between competing telephone companies. Reports from headquarters of the Association state that $40,000 has already been pledged for the prosecution of such suits by leading operating companies and men, and it is reported also that certain Independent manufacturers have pledged themselves to contribute immediately $5,000 or more to assist in such prosecutions.

With respect to the contract signed at Richmond, it is authoritatively stated that the Board of Directors of the Home company authorized the contract to be signed by the vice-president and secretary, and it was so signed during the absence of President Lindemuth. He had no knowledge of the conclusion of the arrangement until he saw a statement of the fact in the newspapers.

Telephone Service and the Great Flood at Dallas, Texas

Between the hours of 2 and 3 o'clock, Monday morning, May 25, all of the electric lights in the City of Dallas, Tex., flickered and expired. Two hours later the water works pumps of the city stopped work and the metropolis of Texas was dark and, inwardly, dry. By 7:30 o'clock every telephone in the city was being used to find out what was the trouble, and from that hour until afternoon, when connections with West Dallas and one branch exchange were carried away, the switchboards at the three central offices displayed their fireworks like a Fourth of July celebration. That is to say, about every signal lamp on them was registering a call. The "load" jumped from a previous maximum record of 120 to a new record of 235.

The cause of it? Simply a flood in the Trinity River. The Trinity River will seldom strike the observer as a very dangerous stream. But upon this occasion it had attained a width of two miles, a depth of from ten to forty feet and a swiftness of current nearly equal to Niagara, just above the falls. The Southwestern Telegraph & Telephone Company had four heavy leads crossing the Trinity bottoms, Northwest, West, Southwest and South, and exchange trunk lines to the "Cliff" branch exchange and West Dallas. These were all swept away by the flood, and nothing was left upon which to hang a single wire except the swaying tops of a few trees and some skurrying houses adrift in the waste.

The Texas & Pacific Railway lost one mile of trestle and track; the City of Dallas two miles of "Pike"; the Northern Texas Traction Company over a mile of trestle, while the Missouri, Kansas & Texas Railroad, the Santa Fe and the Houston & Texas Central contributed more or less of their bridges to Jupiter Pluvius; and the debris from all of these fell upon the telephone lines and bore them toward the Gulf of Mexico.

The telephone company got busy as early as daylight, but little could be done, except to duck a couple of line foremen who went down with the Texas & Pacific trestle at 10 a. m. They were rescued, but the trestle took a lumber yard and a part of the West Dallas telephone line along with it.

A launch was secured and the task of restoring communication by telephone across the flood was begun. Cables were made from No. 14 paired okonite wire, and as soon as the water receded far enough to expose a bridge timber or a tree large enough to support them, they were hung up in the air and sunk in the water.

On May 27 toll lines were working in all directions. All service was restored in less than six days. But the Trinity River was still high and wide. It did not recede far enough to expose the overflowed lands sufficiently to allow of permanent work until June 8.

In temporary work the company is reported to have used 160,000 ft. No. 14 paired insulated wire, 11,000 ft. 50-pair cable and 6000 ft. 7-pair emergency cable. At the present time work has been made permanent and the material record is about as follows: 75 45-ft. poles, 120 30-ft. and 35-ft. poles, 800 10 pin cross arms, 15,000 lb. No. 12 copper wire, 11,000 ft. 50 and 100-pair cable, with other material necessary to string cable, wires, etc.

New Rate for City Telephones in Fall River, Mass.

The Southern Massachusetts Telephone Company has presented a new proposition to the mayor of Fall River in regard to the furnishing of telephone service to the city. Fall River has been receiving a discount of 50 per cent. off the price charged to regular subscribers, for the city telephones. Besides those in city offices the city rate is allowed to clerks in different departments for which they pay the municipal rate.

The proposition, so far as the financial side is concerned, is that in consideration of one dollar paid by the city for the service, the company will furnish one set of instruments and local exchange service for each 2,000 of the population, as shown by the latest State or United States census till the total population reaches 150,000. According to the latest census Fall River would get 53 telephones under the agreement.

Prospect of Publicity Legislation in Iowa

The Iowa League of Municipalities will hold its annual meeting in Ottumwa, Ia., in September. Among the subjects which are likely to come up for discussion, it is stated, is the passage of a law requiring corporations controlling the public utilities to open their books to the public.

Section 20 of the Interstate Commerce Law requires railroad companies to keep uniform accounts and to open their books for the inspection of the public through its properly designated officers. Certain influential persons in Iowa, among whom, it is stated, are Governor Cummings and Senator Dolliver, are understood to favor the extension of this principle to all public utility companies, which would, of course, include those supplying telephone service. The League of Municipalities is likely to take this matter up for consideration at its meeting.

Buffalo Militia Must Use Frontier Telephones

At Buffalo, N. Y., on the recommendation of County Attorney Sullivan, the joint military and finance committee of the county board of supervisors voted unanimously against paying a bill of the Bell Telephone Company for service rendered to various military organizations of the county. In explanation of this measure, City Auditor Sturm states that some time ago, as was recorded in our columns, the Bell telephones were ordered out of all county offices by the supervisors, and a contract for exclusive service made with the Frontier Telephone Company (Independent).

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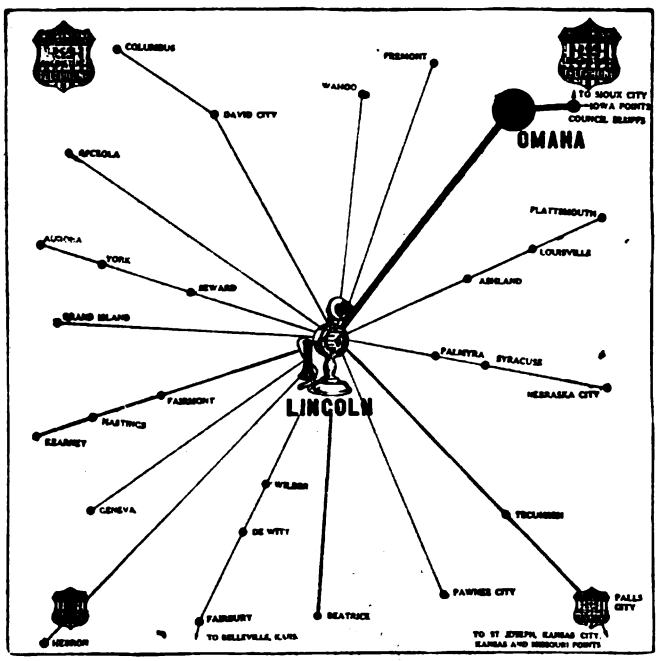
Omaha Connected with Lincoln

Service between the two Independent automatic telephone companies of Omaha and Lincoln, Neb., has just been inaugurated and seven heavy copper circuits are already working. The Independent exchange at Omaha already has 5000 telephones installed and is adding more at the rate of 1000 per month. There are 4000 telephones in the Independent exchange at Council Bluffs, and as that city and Omaha are connected by fifty circuits, Lincoln is thus provided with direct and prompt connections with all Iowa points.

This forms another strong link in the chain with which the Independent companies are binding the eastern half of the State closer together. The long distance company at Omaha has incorporated with a capital of $10,000,000, and as proof of the really large nature of the enterprise it has paid the State a filing fee of $5,000. As further earnest of its intentions, it has set three big construction crews to work building heavy toll lines north of the Platte River; one line is being run to Fremont; another to Blair and the third towards Sioux City. The connection of these lines at Omaha with the toll lines of the Western Telephone Company south of the Platte, where new towns are being daily cut into service on the best of lines, enables the Independents to gridiron the best business section of the State.



Long Distance Connections of the Lincoln Automatic Telephone Company.

The Independents are now furnishing excellent service to Sioux City and to Kansas City, over heavy metallic circuits that make conversation as easily distinguished as though carried on between two persons in Lincoln. Another copper circuit is now being strung to Kansas City to take care of the business offered, and others between Lincoln and Nebraska City, Lincoln and Plattsmouth, Lincoln and Fremont, Lincoln and Columbus and Norfolk, Lincoln and Grand Island and Ravenna to connect at the latter place with the line to Broken Bow, Lincoln to Friend and Geneva, Lincoln to Fairbury and Hebron, Lincoln to Wilber, Dewitt and Beatrice. Five carloads of copper wire will be required and a portion of this has already been received.

The sole business of the Western Telephone Company of Lincoln is constructing and operating toll lines. It has met every demand upon it with remarkable promptness, notwithstanding the large sums involved, and has steadily reached out until it touches all the more important trade centers within a radius of 65 miles and all the larger cities within 100 miles. The accompanying map gives a comprehensive bird's-eye view of the extent of the territory covered, the whole a network of copper wires, especially adapted to give perfect service.

Cards are being distributed in Lincoln calling attention to the Independent long distance lines to Omaha. The reverse side of the cards state that 200,000 telephones can be reached over the Independent long distance lines from Lincoln, and that good service is given to Kansas City, St. Joseph and other large centers.

Nashville Grocers Cling to Blake Telephones

It seems that in Nashville, Tenn., the Cumberland Telephone & Telegraph Company is still supplying antiquated Blake instruments at the rates formerly fixed for grounded line service. In order to do away with this unprofitable service the company issued orders to the effect that all such instruments should be removed on July 1.

In view of the present conditions in the telephone business as existing in other cities where Blake instruments have been unknown for some years, on account of their replacement by superior types, the following resolution is amusing:

"Whereas, The Cumberland Telephone & Telegraph Company issued an order effective July 1, 1908, ordering all Blake telephone instruments removed; and,

"Whereas, The members of the Retail Grocers' and Merchants' Asociation have been using said Blake telephone instruments for a long number of years without complaint; and,

"Whereas, The removal of said Blake instruments will result in a raise in rates of 40 per cent for telephones to be substituted for the Blake telephones; and,

"Whereas, The members of this Association believe that the only solution of the telephone question lies in a process of regulation by the next General Assembly of the State,

"Resolved, therefore, by the members of the Retail Grocers' and Merchants' Association in meeting assembled, that we protest against the removal of said Blake telephones or instruments and said increase in rates; that a committee of three be appointed to confer with the president of the Cumberland Telephone & Telegraph Company in an effort to have him revoke, until after the meeting of the next General Assembly of the State, said order requiring the removal of said Blake instruments on July 1, 1908."

It is further reported that Mayor Brown has taken a personal interest in the situation, and has advised the grocers that any agent of the company who attempts to take their telephones from their premises can be arrested. They must be free to hug their chains.

One System, Independent, for High Point, N. C.

It is somewhat amusing to note in the Raleigh, N. C., *Observer* of June 25, 1908, the following interesting comment from the High Point local correspondent:

"The business men and citizens of High Point have already taken steps showing that they are not in favor of two telephones for the manufacturing city, and expressing their favor for the North State Telephone (Independent) Company in a signed statement of several hundred signatures against the Southern Bell system, now being installed here. It is pointed out in the communication that the Independent companies have got practically all the business in towns close to High Point, where the Bell system is in vogue, and that with the united efforts of the citizens here that the Independent company will get practically all the business here."

Salt Lake City Attorney Says Bell Company Has No Franchise

Since the recent agitation concerning the enforcement of the license tax against telephone companies in Salt Lake City, City Attorney P. J. Daly has said that the Rocky Mountain Bell Telephone Company has no franchise. It seems, however, that the city is stopped from asserting that there is no franchise because the company has since 1883 been recognized by the Council as having certain rights tantamount to a franchise.

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It is expected that in order to settle the license tax question and clear up the situation in other respects, Mr. Daly will have prepared a franchise for the Bell company which confirms any existing rights the company may have and will run until 1923, when the company's corporate existence expires, according to the articles of incorporation.

Michigan Traffic Association

The first quarterly meeting of the traffic committee of the Michigan Independent Telephone Traffic Association was held at Grand Rapids, Mich., June 19, 1908. The secretary-treasurer's report for the fourth fiscal year, which closed May 31, showed that the association had passed through the best and most important year of its history. The business handled during the year showed an increase of 9¼ per cent over the previous year's business. The average message value was .2509.

One important part of the association work is that of the check error department. The reports show that 52 7/10 per cent of the check error reports sent out were acknowledged and proper remittances made for same.

One other point of interest in the report was the error so many companies make in giving closer attention to their records of "collected" business, than the business "sent collect" and "received paid," there seeming to be a tendency toward carelessness in making up reports unless they were actually collecting the amount for same. They forgot apparently that they were interested in the "received" business as well as the originating business. This was proven by the fact that the report shows $4.336.51 reported to the association during the year in excess money.

During the year the association has given out new rate books and is still continuing its standard toll form department. The records show that all of the principal offices have been supplied with books, and that a large number of the companies are patronizing the standard toll form department.

The total cost of running the association was 5 8/10 per cent of the gross business or 1½ cents per message.

The consideration of the question of through business and the devising of better plans for handling it was postponed on account of the inability of the committee appointed by the Michigan Managers' Association to be present. This subject will be taken up at the next meeting if the managers' committee can be present.

Service Commissions Versus Competition

A most important and interesting decision was rendered in New York City last month, when the New York Public Service Commission, First District, denied the application of the Long Acre Electric Light & Power Company for approval of the issue of $10,000,000 of preferred stock and the execution of a mortgage to secure an issue of $50,000,000 of 6 per cent 50-year bonds, of which $12,000,000 bonds were to be issued at the present time. The decision was written by Commissioner M. R. Maltbie, whose recommendations were approved by the commission. Various reasons are cited in the decision against the issuance of such a huge block of securities, but the chief points of concern to telephone men lie in the remarks made on the subject of competition, these having a very direct bearing on the question of competing telephone systems. The following passages are most significant:

"The whole electric history of New York City points the futility of competition. In the early years of the industry numerous companies were organized. From time to time they were absorbed, only to be followed by new companies frequently encouraged by the city with the idea that competition was the life of trade and that the more competition there was the better would be conditions. But the same procedure occurred again and again. The new companies were merged or swallowed up, until at the present time there are but two electric supply companies operating in Manhattan, and these two companies, although nominally independent, are owned and controlled by the Consolidated Gas Company.

"The history of New York City has been duplicated in nearly every large city in the United States and in most of those in Europe, until at the present time there are few cities where there is genuine competition or where a customer who is dissatisfied with the service or the rates of one company may discontinue the service of that company and connect with another. It is coming to be generally recognized that monopoly control of electric light, heat and power may be very beneficial to the public if one company or the few non-competing companies can be placed under such public regulation and control as will secure for the public a fair share in the many benefits arising from unified management. That competition cannot be depended upon to protect the consumer from high prices and poor service has been fully demonstrated.

"The existence of competing companies necessitates constant opening of the streets to provide service connections to the houses and street mains for the distributing wires. To provide and maintain these additional services and mains means more frequent opening of the streets, more injury to pavements and ultimately more expense to the taxpayers—conditions which the public has been urging should be removed or reduced and not increased.

"Competition also involves duplication of generating plants and substations. Each company must provide sufficient plant not merely to supply the peak of the load, but to meet any accident which may occur. Machinery must at all times be held in reserve, and when there are several independent companies, no one of which may take a momentary advantage of the reserve of the other, they all must maintain reserves very much in excess of what one company must keep where it may fall back upon any and all of its stations to meet a failure at one of them Again, it is well known that one company can generate current for the whole of Manhattan much more cheaply than can several companies, each one of which undertakes to supply the entire borough. Further, the loss due to distribution is larger where there are several systems.

"The result of such duplication of capital and the less economical methods of production and distribution is that the cost of delivering current to the consumer is larger under competition than under efficient monopoly.

"These general grounds of objection are supplemented by several specific ones, of which the subjoined are pertinent to the question of competition:

"Seventh—The applicant has not proved that the existing companies are not properly conserving the public interest and convenience and that it would be to the advantage of the community to have a new company authorized to enter the field.

"Eighth—If a competing company were allowed to begin operations it is not likely that it would continue to operate independently for any considerable period.

"Ninth—Competition would cause inconvenience and expense to the public, would cause duplication of plant, would lead to waste and ultimately be urged as a reason why rates should not be reduced to consumers.

"Tenth—Practically all of the advantages claimed by the applicant as the probable results of competition can be secured through the powers of this commission, and until it has been demonstrated that these are ineffective it would be unwise to adopt a method which has proved to be ineffective in the past."

Albany Home Quarterly Report Shows Good Collections

The board of directors of the Home Telephone Company, of Albany, N. Y., met on July 8, and declared a quarterly dividend of one per cent. on the capital stock of the company. The books of the corporation closed on July 10, and will not be opened until July 20. General manager H. M. Keys presented his report for the quarter ending June 30. The report showed the collections in the period to have been the best in the history of the company.

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Central Home Telephone Company of Kentucky to Be Reorganized

Anticipating the company's inability to pay the interest on its bonds some of the officers and large stockholders of the Central Home Telephone Company, of Louisville, Ky., recently mailed circulars to all those interested, proposing a reorganization as the best plan for the company. According to the terms of the mortgage on which the bonds were issued, the company has six months in which to make the payment before it can be forced into the hands of a receiver on the ground of default. The first step toward a reorganization was taken when a committee was appointed to take charge of the company's affairs with a view to pulling it out of its present difficulties. The committee is composed of George Braden, vice-president of the company; E. M. Drummond, J. J. McHenry, J. D. Powers, and C. L. Robinson. The circular urged the bondholders and stockholders to place their stock in the hands of this committee, giving it full power to act. It is believed that a majority of the stock will be turned over to this committee. The stockholders will receive in return negotiable receipts for all stock delivered to the committee.

The Central Home Telephone Company was organized in Delaware, with a capital stock of $5,000,000 and an authorized bond issue of the same amount. The company was formed to acquire ownership in independent telephone companies in southern Indiana, Illinois, Kentucky, Tennessee and other Southern States. At the present time there is outstanding $3,462,000 in stock and $1,500,000 in bonds. A little more than a year ago the company acquired the Independent Long Distance Telephone and Telegraph Company of Kentucky. Its statement of operations for 1906 showed net earnings of $6,860. No statement was published for 1907.

Independent Development in Montana

The directors of the Montana Independent Telephone Company at a meeting held in Butte elected the following officers: Harry A. Gallwey, Butte, president; Dr. W. H. Hall, Butte, vice-president; Charles J. Kelly, Butte, secretary and treasurer; Thaddeus S. Lane, Butte, managing director.

Patrick Wall, general manager of the East Butte Mining Company and a well known capitalist and mine operator, was added to the board of directors, the board now being composed as follows: H. A. Gallwey, M. S. Largey, Patrick Wall, W. H. Hall, H. D. Brown, Thaddeus S. Lane, L. O. Evans, Con. F. Kelley, J. T. O'Brien and Charles F. Kelly, of Butte; W. G. Conrad and Thomas Couch, Jr., of Great Falls; Frank H. Clinton, of Anaconda.

The company installed in Butte during last week about 60 telephones and is pushing the toll line extensions to Anaconda and eastward from Butte. The Anaconda line has been completed as far as Rocker and will be in Anaconda not later than July 15. From Rocker poles have been distributed and holes dug all the way to Anaconda. The Anaconda exchange will be open for business some time in the latter part of July.

The eastern extension has been completed to the Nine Mile House; that is, 9 miles southeast of Butte. Material has been ordered for the further extension to Logan, Mont., where connections will be made with the Bozeman Independent company's lines, and all other Independent lines in eastern Montana. This extension will be completed during the summer.

It is reported that the Home Telephone Company, of Bozeman, will be completed and open for service early in July, but efforts to get authentic information from Manager Haley have been unavailing and many letters from interested persons in Butte have remained unanswered.

Montana is a very active field in telephone construction. No less than eight companies are engaged in construction work, building extensions and putting in new equipment. They are the Montana Independent Telephone Company, the Rocky Mountain Bell Telephone Company, the Billings Mutual Telephone Company, the Home Telephone Company of Bozeman, Southern Montana Telephone Company of Dillon, Livingston Home Telephone Company, Big Timber Home Telephone Company, and the Lewistown-Billings Telephone Company of Lewistown.

The following interesting data are abstracted from the annual report of Managing Director Lane:

Ninety per cent of all toll calls to and from Butte are made with points within a radius of 200 miles.

East of Billings there remains a gap of only 225 miles to complete the long distance connections via Independent toll lines to St. Paul. The company will utilize the poles of the Great Northern Railway between Butte and Great Falls for the extension of its toll line system north, and this is a part of the work planned for this year.

The completion of these toll line extensions, which can be accomplished within a comparatively short time, will provide long distance facilities within the territory where it is most needed. The number of telephone users who find long distance connections a necessity are only about 10 per cent of the total, and those at present who require such service will retain the service of this company because of its large list of local subscribers.

In the face of an active campaign for business by the competitor of the Independent company during the month of June the business of the Independent company shows a steady growth. New business representing an annual revenue of $3,775 was secured during the period from May 10, 1908, to June 10, 1908, and facilities are taxed to the limit to take care of new business. The present growth of new business will, it is estimated, continue at least during the ensuing year.

The Providence Telephone Company to Be Granted a Franchise in Woonsocket

It is reported that the council of Woonsocket, R. I., will grant an eight year francise to the Providence Telephone Company. The contract between the company and the city expired over a year ago, and the new contract will date from the expiration of the old one. Under the new franchise the company agrees to give the city half-rate telephones and to pay 1 per cent of the yearly gross earning. Also, if there is any reduction in the rates on any part of the Providence Telephone Company's system, the rates in Woonsocket will be lowered accordingly.

Telephone Conversation to Be Restricted

The Providence Telephone Company at Providence, R. I., is shortly to enforce a rule limiting conversations on measured service and party lines to five minutes. Many subscribers are said to have complained of the unreasonable length of time taken by subscribers on the party lines. The company has had these complaints under consideration for some time and finally decided to enforce an old rule which appears in the contracts.

The measured service subscribers can talk as long as they please but they will have to pay extra charge for the privilege. The result is expected to be a material shortening of the average length of conversation.

Weeks Must Not Interfere with Telephone Company

In a recent issue a note was made of the fight of Henry Clay Weeks, Long Island, N. Y., to prevent the local company from stringing wires across his country place known as Vista Lawn. Last week Magistrate Fitch, of the Flushing Court, discharged four of the telephone company's employees who had been arrested for alleged trespass on this lawn. Magistrate Fitch ruled that Mr. Weeks must allow the telephone company to string the wires, as under the order of Justice Jaycox the company has the right to use all necessary force to string wires providing it does not create a disturbance. It is reported that Mr. Weeks has not yet given up the fight to prevent the telephone company from crossing his property.

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Increased Bell Earnings for May

The American Telephone & Telegraph Company's latest report shows total earnings for May of $1,837,529, an increase of $286,685, and net earnings of $1,686,461, an increase of $307,100. There was a balance after interest of $1,038,960, an increase of $219,355. From January surplus after dividends increased, $219,355. The detailed income for the month of May follows:

	1908.	Increase.
Dividends	$634,964	*$11,540
Interest and other revenue	840,145	259,034
Telephone traffic (net)	294,725	*12,696
Real estate	11,743	16,014
Other sources	55,952	35,856
Total earnings	$1,837,529	$286,685
Expenses	151,068	*20,405
Net	$1,686,461	$307,100
Interest	647,501	87,745
Balance	$1,038,960	$219,355

RECEIPTS.

January 1 to May 31:

Dividends	$6,443,344	$758,255
Interest and other revenue	4,136,437	926,498
Telephone traffic (net)	1,669,627	120,674
Real estate	42,579	17,852
Other sources	301,362	142,915
Total earnings	$12,593,351	$1,966,193
Expenses	870,179	19,581
Net	$11,723,172	$1,946,612
Interest	3,224,136	363,690
Balance	$8,499,036	$1,582,922
Dividends April 15	3,050,560	419,532
Surplus	$5,448,476	$1,163,390

Saskatchewan Telephone Construction

The construction programme of the department of railways and telephones of the government of the Province of Saskatchewan has been announced, and tenders will be called for at once for all the materials required to cover the province with a network of telephone lines. Actual construction work will begin early in August, and it is hoped that a considerable mileage will be in operation before winter sets in. In order that work may be resumed as early in the spring as possible the government will secure all its supplies for the season of 1909 during the coming winter.

The long distance lines to be built by the government include the following:

From Lumsden to Prince Albert, connecting with the towns along the Canadian Northern R. R.; a line to serve the towns along the Arcola and Estevan branches of the Canadian Pacific R. R.; branch lines east and west from Warman to the boundaries of the province and following the Canadian Northern R. R.; branch lines paralleling the Wolseley and Reston, Pheasant Hills, Weyburn and Stoughton branches of the Canadian Pacific and Canadian Northern R. R.'s.; a line eastward from Prince Albert connecting Kinistino, Melfort, Star City, Tisdale and other towns and villages: a line crossing the province from north to south and connecting Alameda, Carlyle, Wapella, Yorkton and Saltcoats; branch lines will also be laid out to follow the railway branches into the Goose Lake, Shelburne and other districts, including lines west from Weyburn and northwest from Moosejaw.

In all, the province has mapped out some 600 miles of long distance lines to be built at once, and when this is completed and the province better settled other lines will be built. A number of applications are being received at the department for assistance toward forming local and rural companies, showing that the recent legislation is proving popular.

Consolidation Agitated at Crawfordsville, Ind.

Recently mention was made in our columns of a change in the management of the Home Telephone Company, of Crawfordsville, Ind. In order that plans for rebuilding the system and giving an improved service might be carried out with a guarantee of fair financial returns to investors, application was made to the City Council of Crawfordsville for a franchise that would allow the company to increase its rates. As soon as this application was made to the City Council the Central Union company wrote letters to the Home company setting forth the advantages of consolidation of the two plants in that city. The local papers in Crawfordsville took up the question. Field agents for the Central Union Company visited the city, and efforts were made with considerable success to arouse public sentiment in favor of consolidation, and so embarrass the Home company in its efforts to secure a franchise.

The Home company at first, it is understood, took no notice of the various movements, but one of the local papers dated July 11 published an open letter setting forth frankly and freely its reasons for desiring a new franchise carrying less burdensome rate limitations, and setting forth its attitude with respect to the consolidation proposition. An officer of the company has stated that "it is strictly Independent and will remain so."

Getting the News from Denver

Extensive use was again made of the telephone—as at the Chicago convention—in connection with the Democratic convention in Denver last week. Mr. Bryan, at his home in Lincoln, Neb., listened over the telephone to the demonstration made when his name was presented; and throughout the convention he kept in touch with it by telephone. Reports were also sent long distances, direct from the hall by the telephone; the New York *Evening Post*, for example, receiving a large number of dispatches in that way. There was a great saving in time in this manner.

Project for New Exchange to Continue Competition at Marshalltown, Iowa

Since the Iowa Telephone Company (Bell) has acquired the business formerly carried on by the Independent telephone company at Marshalltown, Iowa, there has grown up very strong sentiment against monopoly telephone service over rural and long distance lines in and about that important center. Responsible men are pushing a project to install an Independent automatic exchange in Marshalltown, which will be affiliated with all the farmers' lines in Marshall County. The new company, if incorporated, will probably be known as the Farmers' & Merchants' Telephone Company.

Telephone Patents

DISCONNECTING DEVICE FOR TELEPHONE LINES. Frederick Johnson and Harry Smith, Hatfield, Mo., patent 892,060, June 30, 1908.

This patent covers a device for cutting off by current of the current from a telephone during an electrical storm, so as to prevent injury to the instrument or house. This is accomplished by dead ending the telephone wires on a post located outside the wall of the building in which the telephone is located. A contact lever is pivoted on the post and provided with a contact head having a depression to engage the line wire at some distance from the post. The house wire is connected to the contact lever at the point where it is pivoted to the post. A loop is formed at the other end of the contact lever to which a cord is fastened. This cord extends through the wall of the

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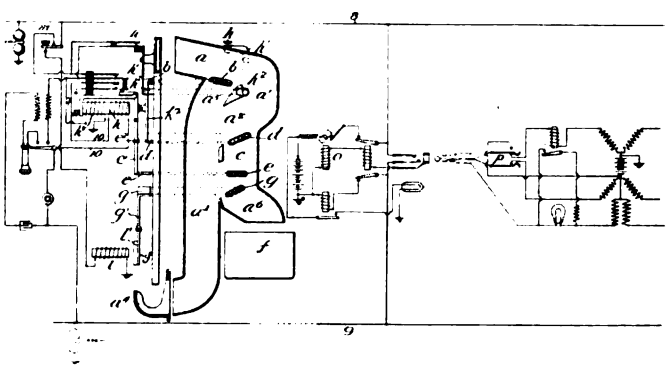
building and is provided with a ring at its terminal. A spring secured to the post, having its opposite end attached to the contact lever at a point between the pivot and the line wire, serves to hold the lever in contact with the line wire. When for any reason it is desired to disconnect the telephone line from the house, the ring on the end of the cord is pulled downward and attached to a suitable peg or hook, thus disconnecting the house wire from the line.

Upon releasing the ring from the hook, the spring tends to pull the contact back into connection with the line, thus permitting the current to flow to the house wire.

COIN COLLECTOR.

Edwin H. Smythe, Chicago, Ill., patent 892,322, June 30, 1908.

This invention relates to a coin collector designed for use in connection with party lines. It is intended to provide against the loss of a coin deposited to call the central office when a line is already in use by another subscriber, and also to provide for



the return of the coin in case the line is out of order, or in case the operator does not respond.

The figure illustrates the circuits of a telephone line with which the coin collector may be associated. Key *m* is provided at each subscriber's station to enable the subscriber to regain possession of the coin under certain circumstances. At the central office, the line circuit is extended through the contact of the slow acting relay *o* and a special key *p* is provided in the operator's cord circuit for throwing current on the line to permit the subscriber to recover a coin.

The coin is refunded, in case the line is busy, by the action of magnet *l* and stop *b*. A contact actuating finger h^2, located at the turn of chute *a*, controls stops and circuits so that the coin can be refunded in case the line is out of order or the operator does not respond. After the operator answers, the coin is under her control and is refunded or deposited by the action of an electromagnet which controls stops *e* and *g*.

MOUNTING FOR ELECTRICAL APPARATUS.

Malcolm E. Launbranch, Chicago, Ill., patent 892,167, June 30, 1908.

This patent covers a removable shelf upon which the operating parts of a telephone set may be mounted so that they may easily be removed from the enclosing case for repairs or inspection. The shelf is arranged to slide between guideways fastened to the sides of the telephone box. Flanges and stops are provided so that the shelf may be drawn out and tilted downward, thus permitting an examination to be made of whatever apparatus is mounted on the shelf. If desired, the shelf may be removed from the box, in case it is necessary to repair any of the apparatus. The act of pulling out the shelf may serve to automatically disconnect the apparatus from the line or circuit with which it is associated.

TELEPHONE CONTROLLING DEVICE.

Nathan Silverson, New York, N. Y., patent 891,961, June 30, 1908.

In this invention means are provided for locking a telephone set to prevent its use by unauthorized parties in the absence of the subscriber; also for permitting incoming calls to be received while locked against outgoing.

In the Manufacturing Field

The Hartmann-Kempf Frequency Meter

For some time past the Dean Electric Company has been looking for a suitable frequency meter which it might adopt in connection with its harmonic converter used in the Dean harmonic selective signaling system. It believes that it has secured a very satisfactory instrument in the Hartmann-Kempf frequency meter, a German instrument, which it has adapted to telephone exchange requirements, and for which it has the exclusive selling rights in the telephone field. This apparatus consists essentially of a series of reeds mounted in a row. The natural period of vibration of each reed varies from that of its neighbor by a determined interval, so that the rates of vibration form an ascending series as the reeds number from left to right. Thus, referring to the lower right-hand indicator in Fig. 1, if a current at 65 cycles is connected to the instrument, the left-hand reed will vibrate. When the frequency increases to 66 the second one will be in vibration, and the left-hand reed quiet, and when the current is alternating at the rate of 66 66/100 cycles the middle reed will be in full vibration and the others quiet. The appearance of the reading is more clearly shown in Fig. 2, which was taken from photograph of the 50-cycle reed in full vibration, when the current was adjusted to a proper frequency.

Interesting points in connection with this meter to which the Dean Company directs attention are that the readings are instantaneous, hence fluctations will be plainly shown; the indicating reeds are the only moving parts; accuracy is maintained unchanged to within 1/10 of 1 per cent., and accurate use of the instrument is therefore not dependent upon the

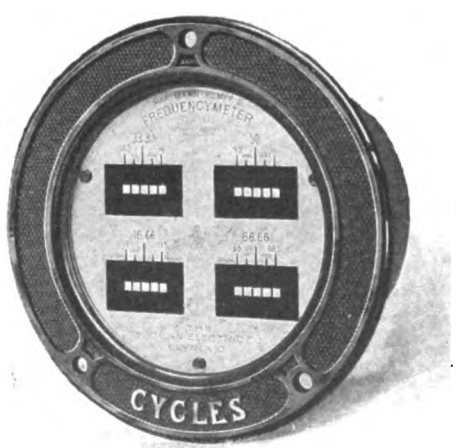


Fig. 1.—The Hartmann-Kempf Frequency Meter.

skill of the person taking the reading; reeds are not affected by variation in wave form, nor changes in voltage. An increase or decrease in voltage simply increases or decreases the excursion of the reed.

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The instrument is at present supplied in two types, one for portable service and the other for mounting in a power switchboard panel; the former is provided with five binding posts, giving a common post and one for each frequency. Resistance

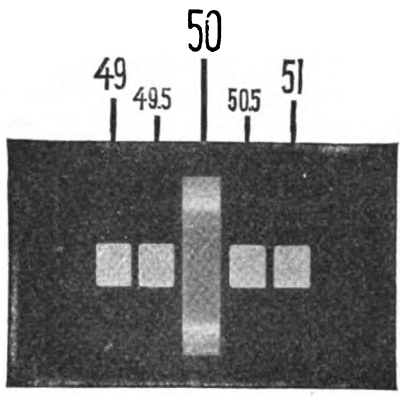


Fig. 2.—One of the Indicators, Taken When Reed Was in Full Vibration.

coils, mounted in the case, are so proportioned and connected as to limit the movements of the reeds to a practical value.

The Connecticut Telephone & Electric Company

The Connecticut Telephone & Electric Company, of Meriden, Conn., is one of the first to lift with the returning tide of business activity and prosperity. The Company states that the volume of sales for June exceeded the record for any previous month in its history. It is now operating all of its plant at full time, and is running some departments at night on overtime.

BULLETIN 30 of the Carbolineum Wood Preserving Company, 349 West Broadway, New York, contains a reprint of an article in the STREET RAILWAY JOURNAL on the open tank method of treating ties and cross-arms. The article has illustrations showing various methods employed in the treatment of ties and cross-arms by different companies. A plant for treatment of this method can be economically erected to meet the requirements of companies both large and small.

The brush method of treatment is also discussed in the bulletin, and its adaptability to various kinds of work is pointed out. This method is greatly used in treating the butts of poles.

THE HOMER ROBERTS TELEPHONE COMPANY, 1703 Melrose Street, Chicago, Ill., has during the past week been exhibiting its telephone train dispatching system at the New York City terminal of the Lackawanna Railroad. Mr. B. H. Allen has shown the selective telephone dispatching system to various prominent railway officials of the East, including Mr. S. P. Griffith, telegraph superintendent of the Erie Railroad; Mr. L. B. Foley, telegraph superintendent of the D. L. & W. Railroad; Mr. F. G. Sherman, superintendent of telegraph, and Mr. Kerwyn, of the Jersey Central; Mr. Edinger, of the Pennsylvania; Mr. Benninger, of the Lehigh Valley Railroad, and others.

THE BLAKESLEE FORGING COMPANY, of Plantsville, Conn., has issued advertising matter describing the well known Donnelly's Climbers. Mr. John D. Donnelly, of Branford, Conn., has announced that in future these climbers will be sold and made exclusively by the Blakeslee Forging Company.

THE FLETCHER MANUFACTURING COMPANY, Dayton, Ohio, has issued a catalogue describing a very extensive line of malleable and gray iron pins and brackets for telephone poles.

W. W. Dean Elected President of the Dean Electric Company

At their last meeting the directors of the Dean Electric Company, of Elyria, Ohio, elected Mr. Wm. W. Dean, former vice-president and chief engineer, to the office of president, in which he succeeds the late S. B. Rawson. The other officers are, 1st vice-president, A. E. Barker; 2d vice-president, Max Koehler; 3d vice-president, T. M. Brush; secretary and treasurer, A. G. Bean.

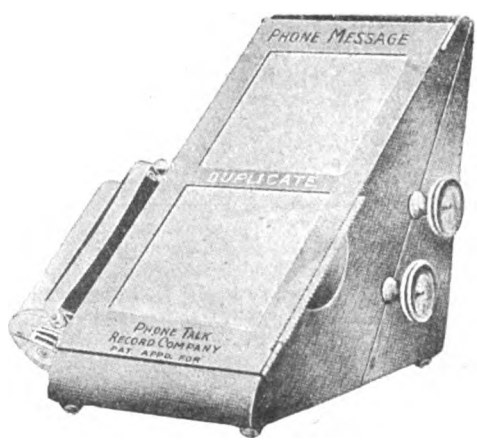
In "The Elyrian," a booklet issued by the Dean Electric Company, Mr. F. A. Cornell calls attention to some of the details of Mr. Dean's remarkably interesting career, in which this is the latest step. In 1889 Mr. Dean had worked up from various grades, beginning with "trouble shooter," to the office of chief inspector of the Bell Telephone Company of Missouri, where he was in charge of all electrical and equipment work. From this place he went to Buenos Ayres, and completely overhauled the system of the Compañia Union Telefonica, which extended throughout the Argentine Republic. Here he accomplished valuable results, while working absolutely on his own resources, without any capable assistance.

His first patents were taken out in 1891, upon his return to the United States, when he again associated himself with the Bell Telephone Company of Missouri.

The attention of the officials at Bell headquarters became directed to Mr. Dean's work, and in 1897 he was called to Boston, and later transferred to the Western Electric Company in Chicago, where he was in charge of the experimental laboratory. His resignation was offered in 1900, and after this he was in the engineering department, and later chief engineer of the Kellogg Switchboard & Supply Company, which position he held until the concern passed out of the control of Mr. Kellogg. Shortly afterward the Dean Electric Company was organized, and the technical worth of its equipment is due to the co-operation of Mr. Dean and the strong staff built on the group of able men who had been associated with him in his previous work, and had joined him in the new organization.

A New Telephone Memorandum Holder

The device shown in the accompanying illustration is intended to meet the need of persons who wish to have a permanent record of telephone memoranda, and at the same time be able to distribute slips torn off as written. Rolls of paper are mounted respectively inside, and at the left-hand side of



A New Telephone Memorandum Box.

the box. The inner roll may be wound off continuously, so that a clean part of the sheet is always in the writing space. Carbon paper is placed between the writing surface and the duplicate sheet beneath, and messages are withdrawn on the latter from the right-hand side, and torn off as required.

The memorandum holder is manufactured by the Phone Talk Record Company, 832-834 Broadway, New York.

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Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

NEW COMPANIES

NAPA, CAL.—Articles of incorporation have been filed by the Clear Lake Telephone & Telegraph Company, whose intention is to construct and operate telephone lines in Napa, Sonoma, Mendocino and Lake Counties, principally between the following points: From Lakeport to Calistoga, Lakeport to Cloverdale, via Highland Springs and Pieta, Lakeport to Kelseyville and from Pieta to Hopland. It has an authorized capital stock of $50,000, and the following directors have been elected: A. H. Spurr, of Lakeport; H. S. Johnson and F. L. Wright, of Santa Rosa. L. J. Shuman and M. S. Sayre, of Lake County, are also largely interested in the new enterprise.

BROOKVILLE, IND.—The Brookville & Oldenburg Telephone Company has filed articles of incorporation with the Secretary of State, and contemplates the construction and operation of a telephone system in Brookville, and throughout Franklin County. It is capitalized at $25,000, and among the incorporators are: I. D. Garrigues, Fred Stumpf, Jr., W. P. Hubbard, R. S. Taylor, Caspar Ritzi, M. P. Senefeld, Frank A. Wright and Herman Trickler.

DYERSVILLE, IA.—The Dubuque & Delaware County Telephone Company, whose principal place of business is to be at Dyersville, has filed articles of incorporation with the County Recorder, and proposes to do a general telephone business. The capital stock is placed at $100,000, and the following officers have been elected: President, George E. McFarland; vice-president, W. J. Van Allen; secretary, treasurer, J. B. Mason. The directorate is made up of: C. E. Hall, W. J. Van Allen, G. E. McFarland, J. B. Mason and Charles Hutchinson.

JACKSON, KY.—Articles of incorporation have been filed by the Jackson Telephone & Telegraph Company. It has an authorized capital stock of $12,000, and among the incorporators are: John T. Ricketts, Nick Hadden, Jr., John D. Young and others. The company contemplates the erection and operation of local and long distance telephone lines in Breathitt, Lee, Perry and Leslie Counties, touching some sections that have no telephones, with its principal place of business at Jackson. Construction work is scheduled to commence at once. Address John T. Ricketts, Manager, Jackson, Ky.

MAPLE RAPIDS, MICH.—Owing to the dissatisfaction caused by the increase in rates by the local company at this city, plans are being formulated by the Business Men's Association for the organization of a mutual telephone company, which will install its own system.

BATTLE LAKE, MINN.—The Amor-Dead Lake Telephone Company has been organized, and a line constructed from Amor (P. O. address Battle Lake) to Ricville. A switchboard is to be installed by the company, which has already secured about forty subscribers at Amor, and other extensions in its plant made.

CONSTANCE, MINN.—Articles of incorporation have been filed by the Anoka County Mutual Telephone Company, of Constance. It has an authorized capital stock of $4,500, and the following officers and directors have been elected: William Nelson, of Constance, president; Fred Russell, of Cedar, secretary; P. J. Johnson, of Constance, treasurer; directors, John Simonson, Charles Haglund and G. Soderburg.

CULBERTSON, MONT.—The organization of the Montana Star Telephone Company, plans for whose formation were well under way some weeks ago, has been completed, and work on the construction of lines from Redstone to Culbertson, and from Culbertson to the west boundary of the Ft. Peck Reservation, at which place connections are to be established with the Glasgow system, is to be commenced. The company has a capital stock of $20,000, and the following officers and directors have been elected: President, I. L. Brooks; vice-president, H. M. Cosier; treasurer, I. O. Slette; secretary, Walter Mathews; directors, I. L. Brooks, H. M. Cosier, R. E. Patch, J. C. Gregory, F. W. Richardson, Dr. C. A. Tillotson, Peter Marron, I. O. Slette and G. W. Tanner.

LEWISTOWN, MONT.—Plans are well under way for the organization of an Independent telephone company, which is to be known as the Farmers' Mutual Telephone Company. It is the intention of the organizers to construct telephone lines throughout the Sage Creek and Louse Creek Country, and to establish connections with the Lewistown-Billings Mutual Telephone Company at Windham.

AVARD, OKLA.—Articles of incorporation have been filed by the Farmers' Mutual Telephone Company of this city. The capital stock is placed at $8,000, and among those responsible for its formation are C. A. Leach, M. E. Hensley, J. J. Armstrong and others.

RALSTON, OKLA.—The Eagle Creek Mutual Telephone Company, which is capitalized at $375, has filed articles of incorporation, and intends to install, maintain and operate telephone lines. The directorate of the company is composed of H. Powell, W. L. McCollough, Fred C. Brader, A. J. Harrell, T. L. Ivy, H. B. Drake, J. F. Mussellman, Earl Clark and I. B. Hinds, all of Ralston.

GOLD BEACH, ORE.—The organization of the Southern Curry Telephone Company has been completed, and work on the construction of the company's lines, which are to extend from Gold Beach to Crescent City, Cal., has been commenced. It has an authorized capital stock of $4,000, and the officers and directors are as follows: E. A. Bailey, president; F. J. Schliemann, secretary and treasurer; W. J. Ward, manager; directors, E. A. Bailey, F. J. Schliemann, W. F. Ward, W. J. Cooley and Delmat Colegrove.

PARKERSBURG, ORE.—The Parkersburg Telephone Company, of this city, has filed articles of incorporation, and contemplates the installation and operation of an up-to-date telephone system. It is capitalized at $2,000, and among those actively interested in the new enterprise are: Albert Snead, Wesley J. Haga and E. M. Randleman.

BELLE FOURCHE, S. D.—A rural telephone company, which is to bear the title of the Belle Fourche Farmers' Telephone Company, has been organized at this city, and the following officers and directors elected: President, H. L. Barnett; secretary and treasurer, W. J. Johnston; directors, H. C. Rathburn, T. W. Eaton and J. A. Gilbert. Arrangements are being made for the construction of lines down the Belle Fourche River.

WHITE, S. D.—The organization of the Farmers' Telephone Association was recently completed at this city by the election of the following officers: A. Smith, president; Charles Lynch, vice-president; Charles Arnold, secretary; J. H. Simmons, treasurer; Ole Erickson, Clyde Wilcox, Thomas Kidman and Frank Murphy, trustees. Stock is to be solicited for the enterprise this Summer, and early in October it is the intention of the promoters to either purchase the telephone lines now in the county, or build new ones. The association proposes to cover the entire county, and it is estimated that a considerable amount of capital will be required to carry out its plans.

BIG STONE GAP, VA.—The Powell's Valley Telephone Company has been organized at this city, and expects to at once commence the construction of a telephone line from Big Stone Gap to Gate City, Va., a distance of 35 miles, and one to Pennington Gap, a distance of 22 miles. The incorporators are C. Clement Gaines, who has been elected manager of the company; E. B. Scott, who has been made secretary, and others.

DEWEY, VA.—The Dewey Telephone Company is being organized at this city by Frank Bowling and others, for the purpose of building a local telephone line to Wise, Va., a distance of sixteen miles, where connections are to be established with the lines of the Virginia & Tennessee Telephone Company.

KETTLE FALLS, WASH.—Articles of incorporation have been filed by the Kettle Falls & Columbia River Telephone & Electric Company, of Kettle Falls. It has an authorized capital stock of $5,000, and among the incorporators are: A. H. Nettleton, C. H. Livermore, A. W. Smith, A. Heidedder and W. J. Stambaugh.

SNOHOMISH, WASH.—Active steps are being taken by a number of prominent citizens of this city towards the organization of a home telephone company, to be owned, operated and controlled by residents of Snohomish. A committee of about twenty business men has been appointed to arrange the details of the formation of this new enterprise.

WORTHINGTON, W. VA.—The Marion Telephone Company, of Worthington, W. Va., has filed articles of incorporation with the Secretary of State, and proposes to install, maintain and operate a telephone system in that city. The capital stock is placed at $5,000, and among those interested in the new enterprise are: Frank H. Shore, Monongah; George L. Howell, F. M. Thompson, J. P. Sandy, of Worthington; Otis F. Martin, Fairmont.

MORINVILLE, ALB., CAN.—The Morinville Telephone Company has filed articles of incorporation, and proposes to install and operate a local and rural telephone system.

KINTORE, ONT., CAN.—Articles of incorporation have been filed by the Nissouri Telephone Company. It has an authorized capital stock of $15,000, and among the incorporators are: D. McMillan, W. I. Hogg, W. H. McGee and others.

MULL, ONT., CAN.—The Farmers' Long Distance Telephone Company has been organized at Mull through the consolidation and reorganization of two local companies, and already has fifty miles of line in operation, with seventy-five subscribers. The company, which is capitalized at $40,000, and which is planning much new construction work, has elected the following officers: President, Neil Watson, Mull; vice-president, James Rutherford, Blenheim; secretary, Let Edmunds, Blenheim.

LUMSDEN, SASK., CAN.—The Lumsden Radial Telephone Company, which was organized a short time ago, has filed articles of incorporation, and expects to install a local system at Lumsden.

YELLOW GRASS, SASK., CAN.—The Yellow Grass Telephone Company, which was recently organized, has been incorporated, and construction work is to be commenced at an early date.

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Condensed News Reports

FRANCHISES

PHOENIX, ARIZ.—A 50-year franchise to construct telephone lines over the roads of Maricopa County has been granted by the Board of Supervisers to the People's Independent Telephone Company.

EL CENTRO, CAL.—Application for a franchise at this city has been filed by the recently organized Imperial Valley Home Telephone Company.

LEESBURG, IND.—A twenty-five-year franchise to operate a telephone system at this city has been granted to Walter H. Stanley and John E. Armstrong, the promoters of the new telephone company, whose intention is to install an entirely new plant if possession cannot be obtained of the local system at Leesburg. Messrs. Stanley and Armstrong now own exchanges at Cromwell, North Webster, Wilmot and a toll line to Ligonier, as well as half interest in a line to Pierceton.

WINDFALL, IND.—The Town Trustees of this city have granted to the Leisure Telephone Company, which operates at Leisure, six miles east of Windfall, a franchise to operate in the latter city, the term of the franchise to be for 45 years. Connections are to be established between the two cities at once.

CORNETTSVILLE, KY.—The Leatherwood Telephone Company is securing franchises for the building of a local Independent telephone line from Little Leatherwood to Turkey Creek, a distance of about 12 miles. Construction work is to be commenced at an early date under the direction of the manager of the company, A. Cornett, Cornettsville, Ky.

HALL, KY.—The Upper Rockhouse & Beaver Telephone Company, of this city, has applied for a franchise to construct a telephone line from Puncheon to Jack's Creek, a distance of 16 miles. The company, of which C. C. Martin, Hall, Ky., is manager, and T. A. Cook, Democrat, Ky., is secretary, is just completing a line from Colson to Hall.

HARRODSBURG, KY.—A renewal of its franchise for 20 years has been granted to the East Tennessee Telephone Company at this city, and it will at once commence making extensive improvements in its plant.

LEBANON, KY.—A telephone franchise at this city was sold to J. M. Estes, a local capitalist, the consideration being $250.

SUTTON, KY.—The Sutton Telephone Company, of this city, is securing a franchise for a new line from Sutton, via Ash Camp, to Elkhorn Creek, a distance of sixteen miles. Later on connections are to be established with the Letcher County Home Telephone Company, of Sergent, Ky., at Baker.

NORTH ANDOVER, MASS.—The New England Telephone & Telegraph Company has applied for permission to erect lines on Academy Road in this city.

MAPLE CREEK, SASK., CAN.—A franchise for the installation of a telephone system at this city has been granted to G. W. Quick, who agrees to start work on the system at once. Rates are to be $24 and $15 for business and residence telephones respectively, and the franchise terminates after five years.

FINANCIAL

ROACHDALE, IND.—The Citizens' Co-operative Telephone Company, of Roachdale, has increased its capital stock from $2,000 to $7,000.

NEW BEDFORD, MASS.—At a recent meeting of the Automatic Telephone Company, the directors declared the regular quarterly dividend of 1½ per cent.

DEER RIVER, MINN.—The capital stock of the newly organized Deer River Telephone Company has been increased from $5,000 to $10,000, and work on the construction of lines in Itasca and the adjoining counties is to be commenced at an early date.

SPOKANE, WASH.—The Interstate Telephone Company has declared its semi-annual dividend, amounting to 3½ per cent. The company, which has been doing a great amount of new construction work, reports that its business has increased from 30 to 40 per cent since the first of the year.

WHEELING, W. VA.—Final action was taken by the directors of the Belmont Telephone Company, at a meeting recently held in Bridgeport, in regard to the issuance of $100,000 of new preferred stock, which is to be issued to make extensions in the company's system. It is officially stated that more than half of the new stock, which is 7 per cent accumulative preferred, has already been subscribed. The extensions proposed by the company will cover a good part of Eastern Ohio, and all of Belmont County that is not already included in its circuits.

CONSTRUCTION

CHICO, CAL.—The entire system of the Pacific States Telephone & Telegraph Company at Chico is being reconstructed.

LAWRENCEVILLE, ILL.—A modern telephone exchange building is being erected at this city by the Citizens' Telephone Company, in which the most up-to-date equipment is to be installed.

FORT WAYNE, IND.—Many improvements and extensions in its plant in this city are being made by the Home Telephone Company.

MASSENA, IA.—Work has been commenced by the Massena Independent Telephone Company on its new lines at this city.

SIBLEY, IA.—The lines of the Western Electric Telephone Company are being reconstructed in Sibley.

SPRINGDALE, IA.—The lines of the Springdale & West Liberty Mutual Telephone Company are being entirely rebuilt at West Branch, and other extensions and improvements in its plant made.

PIKEVILLE, KY.—Arrangements are being made by the Eastern Kentucky Home Telephone Company for the construction of a line from Pikeville, via Robinson, Shelby, at which place an exchange is to be installed, and Etty, to Baker, where connections are to be established with the Letcher County Home Telephone Company's line. About 36 miles of line are to be erected, the work to be under the supervision of the manager of the company, N. Starkey, of Pikeville.

SERGENT, KY.—The Letcher County Home Telephone Company, of which W. B. Webb, of Sergent, is manager, is building a short-line extension from Colby to Hillard. An extension from Colby to Blair Branch is soon to be commenced, and the company will be in need of construction material.

MONROE, MAINE.—The lines of the Monroe & Brooks Telephone Company are being extended from Monroe to North Searsport. It is the company's intention to ultimately extend its system to Searsport village, as well as to Swanville.

OAKLAND, MAINE.—Construction work upon its lines in this city is soon to be commenced by the Farmers' Telephone Company.

LANSING, MICH.—The plant of the Michigan State Telephone Company at this city is being thoroughly overhauled, and much new equipment is to be installed.

SANDUSKY, MICH.—Among the extensions in its plant being made by the Sandusky Telephone Company is the construction of a line from Laurel to Juhl.

FREEPORT, MINN.—The Freeport Telephone Company is building new lines to St. Martin and Upsalla, in order to take care of the new business which it has secured at these places.

HARDWICK, MINN.—The lines of the South Dakota Telephone Company are to be extended to Hardwick, at which place a switchboard is to be installed.

CANASTOTA, N. Y.—The plant of the Farmers' Telephone Company of this city is to be materially enlarged and improved.

CHAMPLAIN, N. Y.—It is only a question of a very short time when the Champlain Telephone Company's line will be connected with the new system now being installed at Ellenburg. Lines are being built north and west of Mooers Forks, and communication will soon be established with all towns along the Rutland R. R. up to Malone, inclusive. Plans are also being considered for the extension of the company's lines to Hemmingford.

LOWVILLE, N. Y.—The Black River Telephone Company, with headquarters at Lowville, is making many improvements and extensions in its system.

DENTON, N. C.—Construction work has been commenced by the Denton-Farmer Telephone Company on the line which it is to construct from Denton to Farmer and Asheboro.

MONESSEN, PA.—The Bell Telephone Company is planning to completely overhaul its local system at this city, and it is expected that about two months will be required to put the plant in first class shape.

SHENANDOAH, PA.—The new line of the Farmers' Telephone & Telegraph Company is now connected with the local exchange of the United Telephone Company, the new company having purchased the United line from Shenandoah to Ringtown. Connections have also been established with Ringtown and Zion's Grove, and lines are to be built very shortly to Brandonville, Roaring Creek and other places in the farming districts.

WARREN, R. I.—A new exchange building has been erected at this city by the Providence Telephone Company, in which is to be installed the most modern equipment. The company expects to operate lines from this exchange not only in Warren, but also to Swansea, Mass., Barrington and a small portion of Bristol.

BANDERA, TEX.—It is the intention of the Bandera Telephone Company to extend its lines to Kerrville.

MARLIN, TEX.—A telephone line connecting a considerable portion of the neighboring farming district with Marlin is being erected by Nick Goodrich.

LYNCHBURG, VA.—Work is soon to be commenced by the Southern Bell Telephone & Telegraph Company on a new line between this city and Danville, and another new line to Goode.

NORTON, VA.—The East Tennessee & Virginia Telephone Company is preparing to install an exchange at Appalachia, Va. It is also its' intention to build an exchange at Dorchester, a near-by mining town, besides making a number of other extensions, for which a considerable amount of line material will be required. R. T. Crabree, of Norton, is manager of the company.

PUYALLUP, WASH.—The Pake Telephone Company has commenced work on the construction of its system at this city.

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Condensed News Reports

WATERVILLE, WASH.—The lines of the Farmers' Independent Telephone Company are to be extended into Chelan County, connecting with the lines that are on the west bank of the Columbia.

MINOCQUA, WIS.—The newly organized Minocqua Telephone Company expects to at once commence the construction of a telephone system at Minocqua, Woodruff and Arbor Vitæ, and as soon as possible will build a number of branch lines into the country surrounding these cities.

WINNIPEG, MAN., CAN.—The Manitoba Telephone Commission has received applications from some 1350 farmers in the province who want rural telephones, and arrangements are now being made to accommodate them.

WINNIPEG, MAN., CAN.—The following municipalities in Manitoba are constructing their own rural telephone systems. Brenda, Morton, Argyle, Woodworth and Wallace, and several others are to be added to the list in the immediate future. These systems are to be connected up by the Government long distance lines. In the Municipality of Macdonald the farmers are constructing their own lines, and these will be connected with the Government trunk lines.

MURRAY BAY, QUEBEC, CAN.—The Charlevoix & Saguenay Telephone Company, which is capitalized at $40,000, and of which E. G. Guggan is president, and A. E. Couet, secretary and treasurer, is planning many extensions in its system, which now extends from Murray Bay to Baie St. Paul. An exchange building is now being erected at the former city, and lines are soon to be built to St. Joachim, St. Agnes, Tadousac and other neighboring municipalities. Connections are also to be established with the Chicoutimi Telephone Company at St. Urban, near Baie St. Paul.

CARLYLE, SASK., CAN.—Plans are being considered for the construction of a telephone line between Carlyle and Alameda, the Saskatchewan Government having been petitioned to do this work, and it is likely that it will be included in the 600 miles to be built in that province this summer.

MILESTONE, SASK., CAN.—The Milestone & Southwestern Telephone Company has completed about 27 miles of its system, and has secured about 47 subscribers.

WAUCHOPE, SASK., CAN.—The recently organized Wauchope People's Telephone Company expects to commence work on the construction of its system at once.

ELECTIONS

JACKSONVILLE, FLA.—The officers of the Florida Telephone Association are W. G. Brorein, president, Tampa; E. E. Voyle, vice-president, Gainesville; Geo. B. McKean, secretary and treasurer.

COMFREY, MINN.—The Comfrey Rural Telephone Company, at its annual meeting, elected the following officers: President, J. A. Prim; vice-president, Oscar Thor; secretary, C. L. Lindersmith; treasurer, Oscar Erickson.

MULLEN, NEB.—The following officers have been elected by the Hooker County Telephone Company: D. A. Walker, of Mullen, president; F. A. Meidell, of Seneca, vice-president; Charles Rodgers, of Mullen, treasurer; A. L. Dawson, Seneca, secretary. A new switchboard has recently been installed by the company, and other improvements are planned.

LACONIA, N. H.—At a recent meeting of the stockholders of the Citizens' Telephone Company, of this city, at which a most satisfactory financial report was made, the following officers and directors were elected: President, A. W. Abbott; treasurer, S. B. Cole; clerk, E. H. Shannon; manager, W. D. Johnson; directors, A. W. Abbott, John H. Dow, H. Bickford, T. E. Prescott, V. C. Haserick, J. W. Ashman, of Laconia; C. H. Odell, Sanbornton; W. B. Fellows, Tilton.

CAMDEN, N. Y.—The following officers have been elected by the Camden Home Telephone Company: President, L. P. Haviland; vice-president, B. L. Stone; secretary, A. M. Farnsworth; treasurer, E. S. Marble. The directorate is made up of L. P. Haviland, B. D. Stone, A. M. Farmsworth, E. S. Mabie, H. L. Borland, T. H. Ferris, I. D. West, A. T. Wilkinson and A. C. Woodruff.

PAVILION, N. Y.—The following officers have been elected by the newly organized Pavilion Telephone Company: President, H. S. Bradley; secretary and treasurer, D. C. Higgins.

CAMBRIDGE, OHIO.—The following directors have been elected by the Cambridge Home Telephone Company: J. M. McKitrick. William Hoyle, T. W. Scott, M. L. Hartley, D. M. Hawthorne, H. P. Woodworth and C. C. Cosgrove. A considerable amount of new construction work has been done by the company, and an additional amount is being arranged for.

MISCELLANEOUS

BUSHNELL, ILL.—The Bushnell Telephone Company's exchange at this city, formerly the property of F. B. Hopkins, has been acquired by the Illinois Western Telephone Company, of Macomb, which will take possession immediately.

GALESBURG, ILL.—As a result of a severe storm which visited this section the lines of the Galesburg Union Telephone Company in the southern part of the city, and its toll lines to Abington and south into the country are out of commission.

PETERSBURG, IND.—The offices of the Independent Telephone Company at this city were totally destroyed during a recent fire.

CADIZ, KY.—The principal place of business of the Trigg County Telephone Company, notice of the incorporation of which was recently given at Frankfort, is at Cadiz. Its capital stock is $2,800 instead of $1,000, and construction work is to be commenced at once on local lines from Cadiz to Birmingham, Ky., and from Cadiz to Hopkinsville, Ky., 60 miles. Address C. T. Briggs, manager, who is to have charge of the construction work.

ROSWELL, N. M.—The Pecos Valley Telephone Company has been absorbed by the Roswell Telephone & Manufacturing Company, and the directors of the new company are as follows: L. K. McGaffey, E. A. Cahoon, Joseph W. Pow and J. P. Church.

SYRACUSE, N. Y.—The Onondaga Independent Telephone Company, which recently filed articles of incorporation, the capital stock being placed at $1,500,000, is to succeed the Independent Telephone Company of Syracuse. It will take over all the rights, franchises and property of the old company in the city and surrounding country, and, it is understood, there will be no change in the management of the business of the company. Plans are being discussed for the immediate completion and extension of the system in all parts of the city, and it is stated that about $500,000 is to be expended in making the plant up to date in every respect so as to furnish the best possible service.

MIDDLETOWN, OHIO.—Through a recently consummated deal the Home Telephone Company takes over the property of the Central Union Telephone Company at this city, including its franchise. It is understood that the Central Union Company will only maintain a long distance office in Middletown, and that the Home Company will have entire charge of the local business.

MEADVILLE, PA.—The Crawford Mutual Telephone Company, which recently filed articles of incorporation, its capital stock being placed at $50,000, has taken over the plant of the Conneautville Telephone Company, which includes lines in Conneautville, Springboro, Conneaut Lake, Dicksonburg, Linesville, Norrisville, Saegertown and Meadville. The incorporators of the company are John H. Wright and W. E. Miller, of Jamestown; H. M. Dickson and Curtis L. Webb, of Meadville, and L. D. Corey, of Conneautville. The old plant is to be improved and enlarged, and a number of new lines built.

AUSTIN, TEX.—The name of the Proffitt Telephone Company, of Haskell, has been changed to the Haskell Telephone Company, and its capital stock increased from $40,000 to $100,000.

WHEELING, W. VA.—Arrangements have been made whereby Samuel W. Harper, of Messrs. Harper & Bros., of this city, secures possession of a large block of stock in the National Telephone Company, and becomes an officer and director in the company. The officers of the company are as follows: John A. Howard, president; S. W. Harper, treasurer and vice-president; William C. Handlan, secretary and manager. As the result of this deal Mr. Harper and Mr. Howard each control one-third of the stock of the company, the remaining third being divided among a number of smaller stockholders. The lines of the company are being extended and improved throughout Washington County, and a very considerable amount of additional work is planned.

EDMONTON, ALB., CAN.—The City Council has decided to sell its telephone plant across the river in Strathcona to the provincial government, the consideration being $1,000.

CALEDON, ONT., CAN.—The incorporators of the recently organized Caledon Telephone Company, whose capital stock is $10,000, are S. R. Robinson, W. J. Warner and E. E. Wilson, and work on the construction of a local and rural telephone system is to be commenced at once.

DUNEDIN, ONT., CAN.—The incorporators of the Noisy River Telephone Company, which has filed articles of incorporation, with a capital stock of $10,000 are: D. G. Mitchell, G. B. Moore, T. G. McNall. Construction work on a rural telephone system is to be commenced at once.

SUNDERLAND, ONT., CAN.—Those responsible for the formation of the Sunderland Telephone Company, which has been incorporated with a capital stock of $10,000, are: W. O. Webster, J. Blanchard and W. Tucker.

UNDERGROUND

QUINCY, ILL.—Efforts are being made in this city to have all wires placed underground.

GLIDDEN, IA.—An underground system is to be installed by the Green County Telephone Company at Glidden.

WASHINGTON, PA.—An up-to-date conduit system is being installed in this city by the National Telephone Company.

MILWAUKEE, WIS.—The American Telephone & Telegraph Company, which is installing a conduit system between Milwaukee and Chicago, expects to have the line between Milwaukee and Racine in operation at an early date. The system will connect with the telephone exchanges in the cities and villages between Chicago and Milwaukee.

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This column is open only to operating companies to sell telephone plants or second-hand apparatus. The rate for advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

FOR SALE.—Telephone exchange in Central Illinois; 100 subscribers, no competition, good territory; ⅝ cedar poles, ⅓ native, nearly all new. Address Box 1137, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

POSITION WANTED—By a strictly first-class, up-to-date telephone manager and const. man; 12 years' experience from the ground up. Specialty, overhauling run-down plants. Present position, manager 900 telephones. Highest recommendations. Will give you my services 30 days free if I don't deliver the goods. Salary $80. West preferred. Address Box 1124, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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WANTED.—A capable all-around telephone man, one who will care for switchboards, repair instruments, do wire chief work for company owning several small exchanges with about 2500 telephones and some toll lines; must be a first-class man, of good habits; married man with wife who is first-class chief operator preferred. Give references and state salary wanted. A permanent position to the right man. Address Box 1136, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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DESIGNED with a full understanding of the conditions of telephone service and built electrically and mechanically to meet these demands.

Gould Storage Battery Co.

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Works, Depew, N. Y.
SALES OFFICES: Chicago—Rookery Building
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San Francisco—Monadnock Block
Toronto, Ont.—2 Bloor St. E.

We have on hand newly manufactured, guaranteed apparatus of all makes

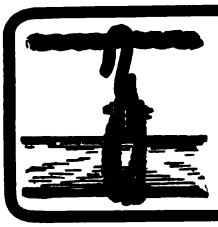
Telephones, Switchboards and Supplies

which we can sell to you at a reduction of 40% to 50% in price. Write us to-day.

We rebuild all kinds of telephone apparatus. Make it as good as new. Consult our repair department.

Missouri Valley Telephone & Electrical Construction Co.

123-25 West 6th St., Kansas City, Mo.



DO YOU OBJECT TO LOW PRICES

provided the quality is unexcelled? Then get our figures on Security Marline Hangers—the hangers that can't come loose.

Ask for Booklet Three.

The F. BISSELL COMPANY

Toledo O.

We sell telephone and electric supplies at better prices than you can buy them elsewhere. Write quick and find out the reason.

THE TELEPHONE & ELECTRIC SALES CO.

NORMAN FURST, MANAGER

606 Heist Building Kansas City, Mo.

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ought to have one of the

"CONNECTICUT" Pocket Meters

in his kit. They make battery-testing easy. Durable, accurate and low in price.

VOLTAMMETER, 0-6V, 0-30 amp., $5.00
AMMETER, 0-30 AMP., . . . 3.50

Circular T describes all sizes.
Write for a copy.

CONN. TELEPHONE & ELECTRIC COMPANY, Inc.
MERIDEN, CONN.

Trouble on Your Lines?

Find It with a Voltmeter.

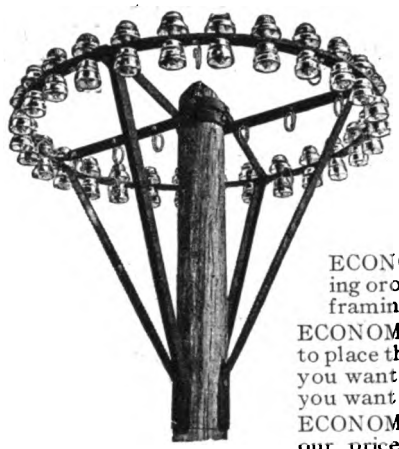
The new Pignolet catalog tells you how, and contains other information that is worth money to any live telephone man.

The catalog is without price. Why not write for it?

Louis M. Pignolet
80 Cortlandt St. - New York

Security Distributing Rings

STAND FOR ECONOMY—AND WHY



ECONOMY in not having to bore holes through the pole at right angles to each other (and this means economy. not only of labor, but of pole as well).

ECONOMY in not squaring or otherwise specially framing the pole.

ECONOMY in being able to place the circle anywhere you want it, and just where you want it.

ECONOMY in the fact that our price includes everything—pins, glass, lags, bolts, washers and bridle rings.

ECONOMY in handling—one complete circle packed in one box.

ECONOMY when your man can install three of our circles in the time required for one of any other make.

ECONOMY in tools—needing only a hand axe, hand line and monkey wrench to instal, and

ECONOMY in first cost—for the cost is little. Prices begin at $13.00.

Made in four sizes.

Send for Booklet Number Three—it tells more

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TOLEDO, O.

WESTON

STANDARD PORTABLE DIRECT READING

VOLTMETERS, AMMETERS, MILLIVOLTMETERS, VOLTAMMETERS, MILLAMMETERS, OHMMETERS, PORTABLE GALVANOMETERS, GROUND DETECTORS AND CIRCUIT TESTERS.

Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS and AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy

Weston Electrical Instrument Company

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Paris, France—E. H. Cadiot, 12 Rue St. Georges.
Berlin—European Weston Electrical Inst. Co., Ritterstrasse No. 88.
New York Office—74 Cortlandt Street.

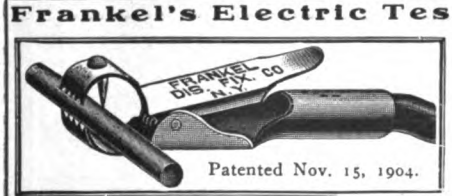
Weston Standard Portable Direct Reading Voltmeter. Model 1.

WILLIAMS TEST CLAMPS

Will pay you a fine profit in the saving of labor and material. They save skinning—they save re-taping—they save time—they save the wire. Send 75 cents for a pair (two), postpaid, on 30 days' trial. Your money back if you want it.

The Williams Test Clamp Co.
720 Electric Bldg. Cleveland, O.

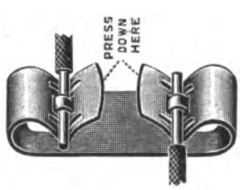
Frankel's Electric Testing Clips



Patented Nov. 15, 1904.

Sample Doz. - 12½ Cts. Each
100 Lots - - 11 " "
500 " - - 10 " "
1000 " - - 9 " "

From your supply house or
FRANKEL DISPLAY FIXTURE COMPANY
733-735 Broadway, New York U. S. A.



Fahnestock "Snap-Over" Connector

For connecting bridging phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.

FAHNESTOCK ELECTRIC CO.
129 Patchen Ave. Brooklyn, N. Y.

Insulated Staples

×1

4 Sizes

Pat. Nov. 1900

×5

BLAKE

TUBE FLUX for SOLDERING

Full Size of Tube, 1" x 5"

Patented Feb. 4, '08

WRITE FOR SAMPLES

COMPRESSED CLEATS FOR USE ON PLASTERING

Exact Size Pat. July, 1906

BLAKE SIGNAL & MFG. CO. 246 SUMMER ST., BOSTON, MASS.

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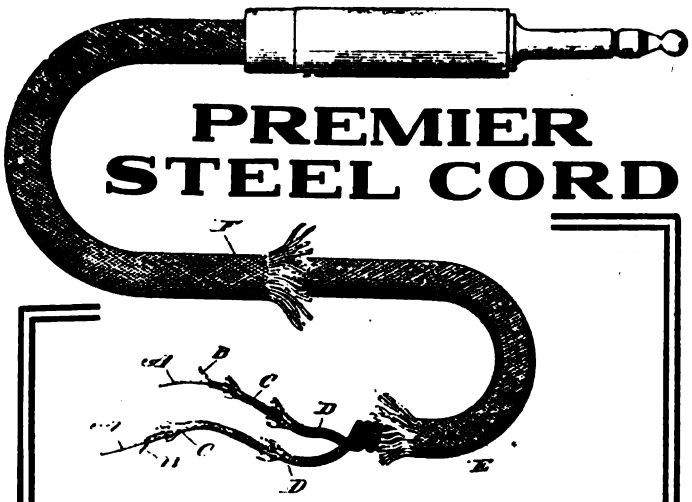

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WILL NOT BREAK

There are just two reasons why it will not break. First, because the cord A is made of specially prepared hard, drawn steel that stands almost incredible service, and second, because this is further reinforced by a steel reinforcing spring in the plug end where the strain is greatest. The most durable cord on the market. Perfect in every other way, too. Details await you.

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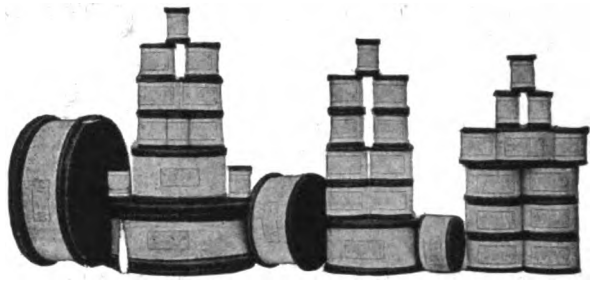
COPPER MAGNET WIRE
GERMAN SILVER RESISTANCE WIRE



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SEYMOUR, CONN.

GERMAN SILVER

RESISTANCE SHEET AND WIRE

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BRASS, BRONZE AND COPPER

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NEW ELEGANT STEEL VIGNETTES.

Publishers of Inter-State Corporation Record, containing all Forms and Blanks for Organizing a New Corporation.

Stock Certificates, Bonds, Corporate and Notarial Seals, Blank Books, Printing, Lithographing.

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PATENTED

Furnish an easy and economical method of erecting cable, and as a means for distribution are unexcelled.

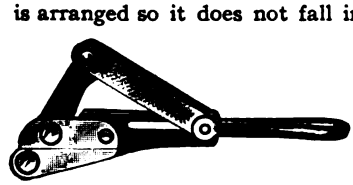
SAMPLES FREE.

CAMERON APPLIANCE CO.

EVERETT, MASS.

KLEIN'S NEW "CHICAGO GRIP"

is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



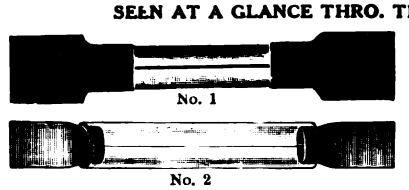
No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.

The CONDITION of the FUSE

SEEN AT A GLANCE THRO. THE GLASS



No. 1

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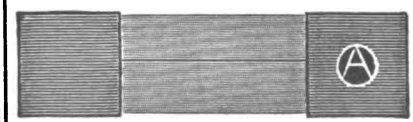
THE "VERIBEST" FUSE (PATENTED)

The Most Perfect Fuse Made. The Wire is protected throughout. A Glass Enclosed Fuse.

PRICE $1.25 PER HUNDRED



Mica Fuses

Copper Term., $1.25 per 100
Foil Term. 1.00 per 100

APPLETON ELECTRIC CO.

CHICAGO NEW YORK

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CABLES

TELEPHONE
WIRE

WIRE ROPE
WIRE STRAND

JOHN A. ROEBLING'S SONS CO.
TRENTON, N. J.

STROMBERG CARLSON
Registered Trade Mark

PRICES UPON APPLICATION

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Rochester, N. Y. Chicago, Ill.

TRADE MARK

IRONITE

Registered U. S. Patent Office

When the "dog days" come and the heat makes copper drop wires sag and stretch—causing much woe and expense—stop the trouble by replacing all your copper drops with IRONITE.

It always costs less than copper and is twice as strong.

Get a sample.

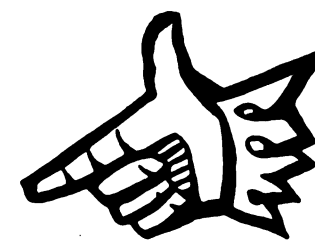
Durant Electric Supplies Co.
52 Fifth Avenue CHICAGO, ILL.

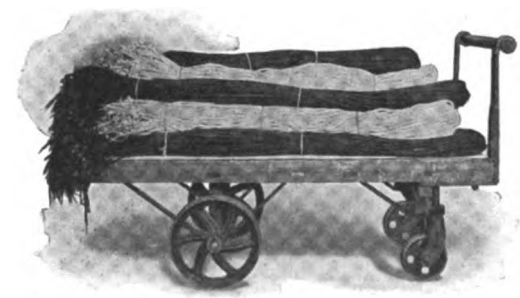
ORDER

STROMBERG CARLSON
Registered Trade Mark

QUALITY

SWITCHBOARD
CORDS





WE SHIP STANDARD CORDS FROM STOCK
THEY WEAR WELL—BETTER THAN OTHERS

STROMBERG-CARLSON TELEPHONE MFG. CO.
Rochester, N. Y. Chicago, Ill.

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ADVERTISING IN SUMMER

CAN your salesman go out to a man's summer home and have a successful interview on the fall purchases?

CAN your salesman go home during the summer with "the man higher up," on Friday afternoon for his regular week end off?

CAN your salesman do a lot of things during the summer that he can do at other times of the year to increase your business?

OF course not, but AMERICAN TELEPHONE JOURNAL can do this for you as it is doing it for others, if you will let it co-operate with your selling force.

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AN ALL PORCELAIN CABLE TERMINAL

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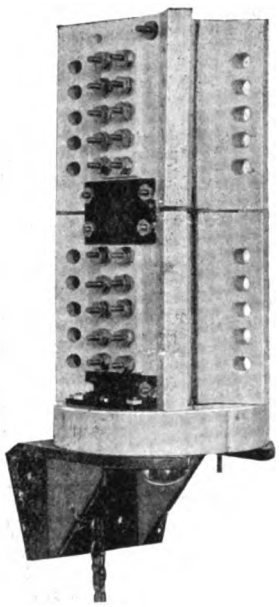


Price Very Low

Send for Sample

AMERICAN ELECTRIC FUSE CO.

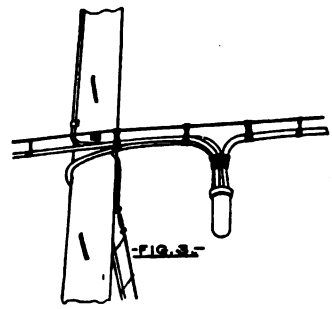
Muskegon, Mich.

Eastern Sales Office, Morton Bldg., New York, N. Y.

Matthews' Cable Splicing Joints

(Formerly called Hargis Joints)

Patented Oct. 17, 1905



Patent Number 802,337

Fig. 3 represents a Number 2 Matthews' Joint, used for the purpose of joining together a main cable of 100 pairs, two 50 pair branches and a 25 pair tap cable for local distribution. This drawing was made from a photograph furnished us by R. Cline, Supt. of Construction for the Central Union Telephone Company, Indianapolis

MATTHEWS' JOINTS are moisture proof.
MATTHEWS' JOINTS are get-at-able.
MATTHEWS' JOINTS reduce maintenance charges.
MATTHEWS' JOINTS are made in three sizes.
MATTHEWS' JOINTS are locked shut.
MATTHEWS' JOINTS are used all over the U. S.
MATTHEWS' JOINTS are used all over Canada.
MATTHEWS' JOINTS will pay for themselves.

Send for free copy of Vest Pocket Edition of Specifications for Cable Splicing. Profusely Illustrated.

W. N. MATTHEWS & BROTHER

Manufacturers of Patented Money-Saving Specialties

214 NORTH SECOND STREET, ST. LOUIS

COOK PORCELAIN TERMINAL—TYPE M 4 LOCK NUT TYPE. No Pot Head necessary with this

COOK TERMINALS AND JUNCTION BOX

Labor-saving, trouble-eliminating devices made for practical telephone men by practical telephone men.

Frank B. Cook

CHICAGO ILLINOIS

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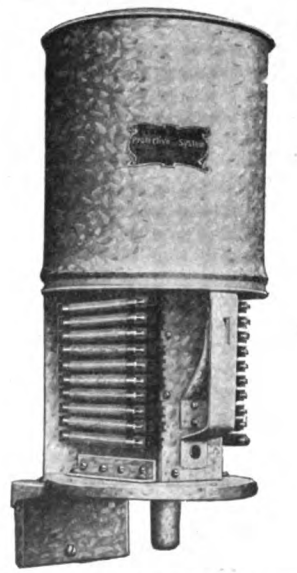

TYPE S-6. COOK POLE CABLE TERMINAL

Cook Specialties are prime favorites whenever telephone men want the best.

Cook Specialties invariably appeal to the man who knows a good thing when he sees it.

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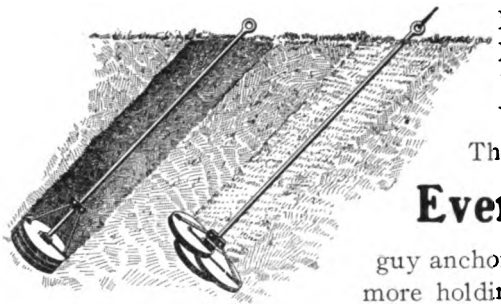
THE ONLY PERFECT LINE PROTECTION

The Sky Rocket Arrester

Built on the Choke-Retardation-Coil Principle. It keeps the static charge below the striking point. What more can you want? It's perfect when you get it and does not deteriorate. Write for prices and details.

CHANCE MANUFACTURING CO.
CENTRALIA, MO., U. S. A.



Price DOWN—Efficiency UP. That's the

Everstick

guy anchor. It has more holding surface than any other, and is sold at a lower price.

WRITE FOR PRICE-LIST
SPECIALTY SALES COMPANY
Cedar Rapids, Iowa

The Bluffton Anchor

Expands in solid earth to a perfect circle. It is the most efficient anchor for use where it is necessary to remove earth.

The dead man is its only successful rival.

Write for details of our 30-day trial proposition.

BLUFFTON ANCHOR CO., Bluffton, Ohio

WHITE CEDAR POLES

Buy from the Producers and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

POLES

Northern White Cedar

Give best service. Our prices are lowest. May we quote?

ITASCA CEDAR COMPANY, Deer River, Minn.

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 26 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Boyne Falls. **W. C. Sterling & Son Co., Monroe, Mich.**

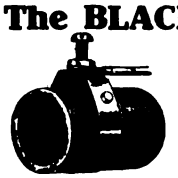
WHITE CEDAR POLES

LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—

YARDS: MENOMINEE, MICH. ESCANABA, " SUPERIOR, WIS. DEER RIVER, MINN.

FRANCIS BEIDLER & CO.
CHICAGO, ILL.

The BLACKBURN GROUND CLAMP



PATENTED

IS THE BEST AND CHEAPEST CLAMP MADE

You may question this statement. If you will let us send you a sample and our prices, you may compare them with others and judge for yourself.

BLACKBURN SPECIALTY CO.
412 Frankfort Ave. N. W. Cleveland, O.

THE AMERICAN TELEPHONE JOURNAL HAS A LARGER CIRCULATION THAN ANY OTHER PAPER IN THE FIELD

M. & B. Ground Clamp

Patent applied for.

For connecting telephone ground wires to lead or iron pipes. Simple in construction; easy to adjust; fits any size pipe. Remains tight whether pipe expands or contracts. No loose connections when our clamp is used. Write us for samples and prices. Milwaukee Electrical Specialties Co., Box 393 Milwaukee, Wis.

POLES AND PILING Chestnut, Red Cedar and Cypress Lengths 16 to 65 feet
J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.
PORTER CEDAR CO., Saginaw, Michigan

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National Pole Company

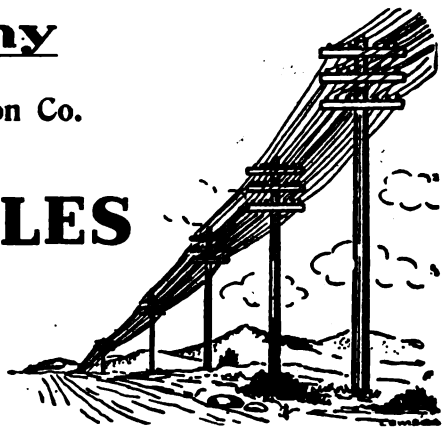
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from Maine to Washington



The Valentine-Clark Co.

ERNEST L. CLARK, President

Michigan / Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.

Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE

234 La Salle Street — Chicago, Ills.

Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.

Tribune Building, Chicago

BISSELL ARMS AND PINS

Our prices get your order, our quality holds your trade. Special sizes a special delight.

Write for Leaflet Number Three.

THE F. BISSELL COMPANY, Toledo, O.

DOTY LUMBER AND SHINGLE CO.

Manufacturers of

Washington Fir Cross Arms. Red Cedar Poles and Piling. In any length.

PROMPT SHIPMENTS

Doty, Washington

WHITE CEDAR POLES

Prompt Shipment — Best Grade

Standard Cedar & Lumber Co.

34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

Telephone Poles

We have complete stocks of Cedar and Chestnut available for shipment East or West. Send us your inquiries.

THE INTERSTATE LUMBER CO.
Cleveland, Ohio

OUR SPECIALTY
SHORT LENGTHS FOR RURAL LINES
MICHIGAN WHITE CEDAR

LARGE LOTS of LONG POLES

Well Seasoned White Cedar

Immediate Shipment

J. W. Morrison Lumber Co.

General Office: 919 Lumber Exchange, Minneapolis

POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY

FARIS & MAYHEW LUMBER & POLE CO.

202 & 203 Continental Building, Denver, Colo.

IDAHO AND MICHIGAN

CEDAR POLES

Large Stocks (10 Yards) Low Prices

Idaho Red Cedar Poles Our Specialty

Western Lumber & Pole Co.

SUITE 415 CHARLES BUILDING · · DENVER, COLO.

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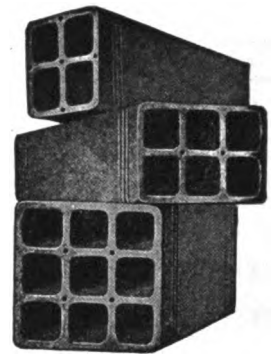
VITRIFIED

CLAY CONDUIT

SINGLE and MULTIPLE DUCT

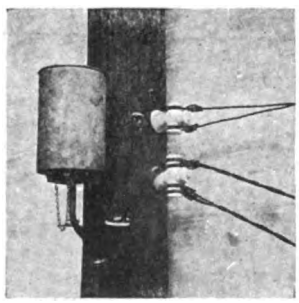


IMMEDIATE DELIVERY ON ALL STANDARD SIZES

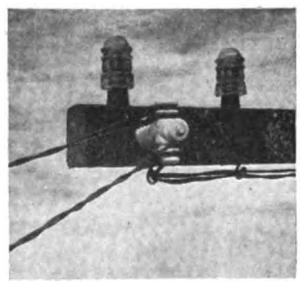
Factories: New Jersey, Pennsylvania, Ohio

Standard Vitrified Conduit Company

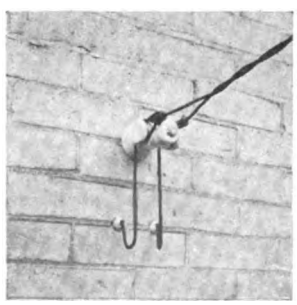
Main Offices: 39-41 CORTLANDT ST., NEW YORK, N. Y.



SUGGESTION No. 13



SUGGESTION No. 4



SUGGESTION No. 5

SUGGESTION No. 8

Somo "UNIVERSAL INSULATOR" Suggestions

They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
Grooves for any direction—Universal,
All porcelain—No rot or rust and very neat.
Cheap to erect; cheaper to maintain.

WRITE FOR DESCRIPTIVE LITERATURE

UNIVERSAL SPECIALTY CO., 118 S. Seventh St., Terre Haute, Ind.

Do You Know That We Have the Most Complete Catalog File

covering the telephone and connected fields?
This file is frequently consulted by visitors from every country in the world. Be sure that we have your latest printed matter always on file. It will help you and will cost you nothing.

AMERICAN TELEPHONE JOURNAL
239 West Thirty-ninth St., New York

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COMMERCIAL

OUR SPECIFICATIONS

A—Compound pours freely at 300 deg. Fahrenheit.
B—Compound exerts no corrosive action on bright copper at a temperature from 300 deg. F. to 350 deg. F.
C—Flashing point of compound 418 deg. F.
D—Burning " " 510 " F.
E—Compound shows no cold flow.
F—Compound loses practically nothing (.005%) after 24 hours at a temperature from 224 deg. F. to 245 deg. F.

Note high melting point, making it especially desirable for Southern climates.

Ask for prices on "Commercial Cable Compound." Made to above specifications—weighs 8 lbs. per gallon.

Commercial Electrical Supply Co.

ST. LOUIS, MO.

"THE" Supply House for Cable Construction Materials.

COMMERCIAL

Calls for Time of Day

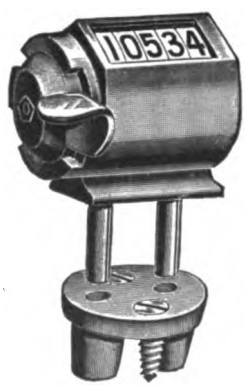
What does it cost you every year to give such service?

How are you equipped for gathering such statistics on traffic conditions as are necessary to properly serve your public in the most economical manner?

The

VEEDER COUNTER

affords the easiest, quickest, most accurate method of making "peg counts."



We have a special Telephone Counter made for such service.

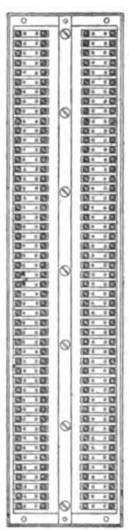
Shall we send our booklet?

VEEDER MFG. CO.

11 Sargeant St., Hartford, Conn.

Manufacturers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings.

YOU'D EXPECT TO PAY MORE FOR SECURITY DISTRIBUTING PANELS



Because they're built so much better.

They're so much more convenient and satisfactory in **every** way.

They afford perfect insulation—quick, easy connections—and can be used (either in a telephone exchange or the ordinary pole house).

But you'll be surprised at the very LOW PRICES.

The F. Bissell Company

226-230 Huron Street TOLEDO, O.

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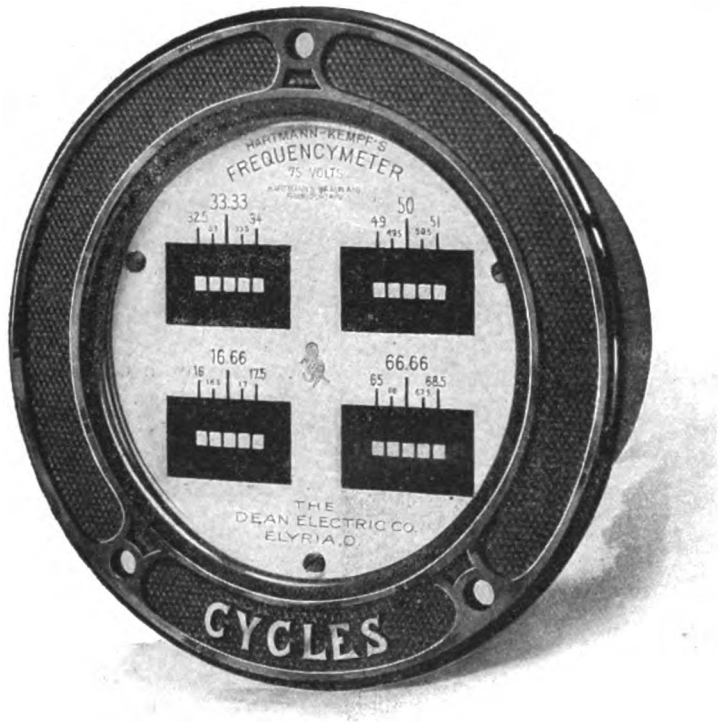


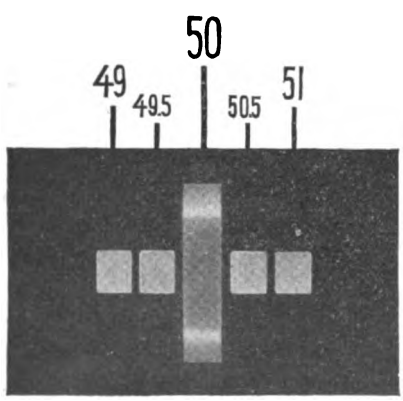
SCIENTIFIC SELECTION

¶ **The "Dean" Harmonic System** is still the only successful party line selective ringing apparatus in the world.

¶ **Absolutely no Failures** is the "Dean" record since the introduction of our Harmonic Converter (registered trade-mark) and our Harmonic telephones.

¶ **No Working Installations** can be shown by some of the makers of imitating appliances—hence the long list of "Dean" successes is abundant proof of superiority.

¶ **Even the Slightest** uncertainty is now eliminated —"Dean" selective ringing is an exact science through the use of the



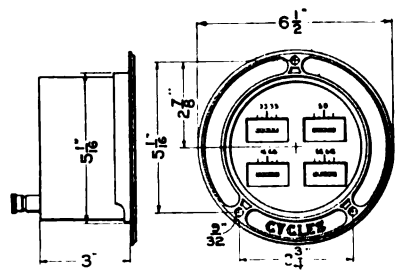
Hartmann-Kempf Frequency Meter.

¶ **With this Instrument** the number of cycles per second may be readily determined—the reading is instantaneous.

¶ **Plain Readings** are indicated by the reeds which vibrate as illustrated. Each of these reeds is a separate unit, even if one should be broken, the efficiency of the others would not be impaired.

¶ **Their Permanency** has been proven by three years' continuous vibration before the invention was marketed.

¶ **Hartmann-Braun A. G.,** the manufacturers, of Frankfort a/M, Germany, have made us the American sales agents for this special instrument.



¶ **The Exact Dimensions** are shown in this drawing. The meter may be mounted in a portable case, or on a suitable mounting board above your power panel; or, it may be specified for any new "Dean" board.

¶ Send for Dean Folder No. 15.

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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Generator Call Wall Telephone

CENTRAL ENERGY STYLE

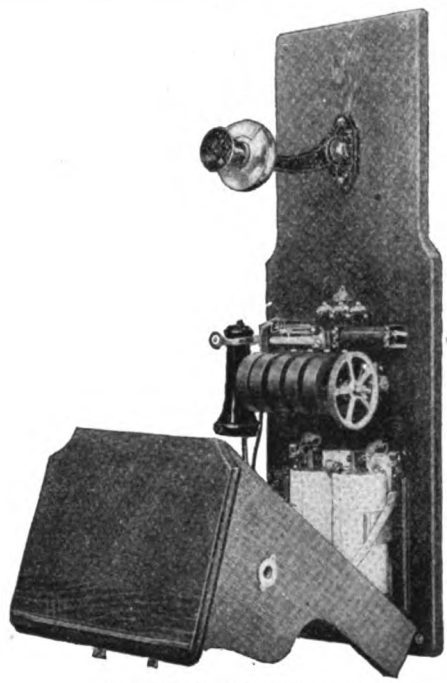
¶ **Accessibility** is best manifested in our **Central Energy Style Telephone** because all the apparatus is conveniently assembled on the backboard—except the ringer.

¶ The construction of the telephone box and backboard provides the real feature of **accessibility** in this type of telephone—the equipment being the same as furnished with our several forms of Magneto Telephones.

¶ Unfasten the screw-lock from front of telephone and **the entire box** hinges from the bottom, exposing the complete contents, as effectively shown in our illustration. To be able to approach the entire equipment without interference by the woodwork construction—**is real accessibility.**

STROMBERG-CARLSON CABINETS

¶ You will be safe in buying "Stromberg-Carlson" telephone woodwork merely on its appearance, but we don't ask you to do this—**we guarantee to deliver to you cabinets that we know will outwear and outlast all others.** ¶ **Firstly**—we know the quality of material cannot be improved. ¶ **Secondly**—that our cabinets are perfectly adapted to the purpose for which they are used. ¶ We offer you the best obtainable—it is economical to buy the best always.



No. 716 Telephone

STROMBERG-CARLSON APPARATUS

¶ First of all you should become thoroughly acquainted with "Stromberg-Carlson" Magneto apparatus. ¶ Our No. 7 TRANSMITTER is earning a higher position daily—are you interested enough to write? ¶ The creditable fact is that it excels under all tests where others fail. ¶ Is perfect transmission worth anything to you? ¶ Equally efficient are all other parts of Stromberg-Carlson Magneto Apparatus.

OTHER FEATURES

¶ In mounting all the apparatus on the backboard—the line binding posts have been taken within the space covered by the telephone box—simplifying as well as greatly improving the general appearance. A partition in the box comes between the generator and top of the batteries, forming a separate yet ventilated compartment for the batteries.

¶ There is plenty of room for installing the "Sure Ring" Condenser and "Push Button Key" which are furnished with any standard Series or Bridging equipment in this style of telephone woodwork.

¶ Further information and prices contained in our Pamphlet No. 1 mailed upon request.

STROMBERG-CARLSON TEL. MFG. CO.

ROCHESTER, N.Y.-CHICAGO, ILL.

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"An Ounce of Service

is worth a ton of sentiment." That's a pretty good motto. It occupied a prominent place on the walls of the Illinois Association's Convention Hall in Champaign the last week in May. It was the keynote of the Convention; it is becoming the keynote of the Independent movement.

That Ounce of Service—

Are you giving it to your subscribers, or are you giving them a fraction of it and the rest in sentiment? The people who have had their ton of sentiment in connection with the Independent movement are now clamoring for their ounce of service.

You can give it

to them, in quantity, perhaps, with your present manual equipment, but you can't give it in quality without automatic equipment. The Independent-Bell struggle is going to result eventually in the "survival of the fittest." Get automatic equipment and be among the fittest.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Benton, Minn.
Lansing, Mich.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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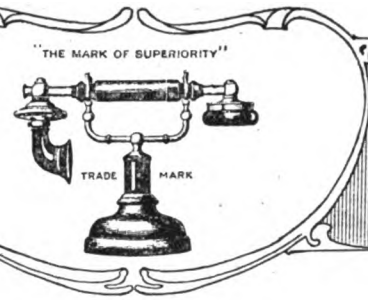
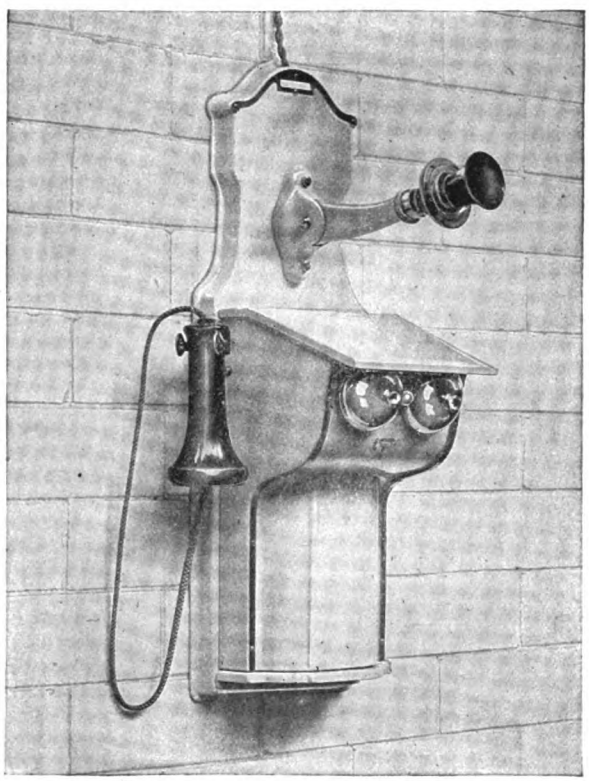


The Ericsson All Steel "Hospital Set"



No. 315 All Steel Magneto, Adjustable Arm, White Enameled "Hospital Set."

Hospitals and kindred institutions require fixtures which are entirely sanitary.

White enameled metal is used for making these and wood is almost entirely excluded, this because wood cannot be so easily or thoroughly cleansed.

The all steel "Hospital Set" is beauty itself. The finish is pure white enamel and can be subjected to the same rigid cleanings as the other metal fixtures.

There are no corners where dirt might collect and every part is easy of access, making it the ideal set for the purpose.

This is the smallest wall telephone of its kind manufactured and in every way is the most serviceable and durable.

Write for prices—it's another "Superior" Product.

L.M.ERICSSON TEL.MFG.CO.
BUFFALO, N.Y.

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WHAT Plutarch said of fame can easily be said of advertising: "Good fame is like fire; when you have kindled it you may easily preserve it, but if you once extinguish it you will not easily kindle it again."

THE man who drops his advertising in the summer extinguishes the fire and finds that he cannot easily re-kindle it when he needs to.

IT is persistency that wins, not doubt and distrust: the man who displays confidence begets confidence.

THERE is every indication of a revival in business in the telephone field and purchasers are making up their minds NOW as to their needs and what they will purchase.

NOW is the time to come before these purchasers and secure their business, NOW, while they are making their inquiries and deciding upon what they want.

Do it now!

American Telephone Journal

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JUST ONE GLANCE

PATENTS PENDING

is *all* that is necessary to impart the character of this telephone—the arrangement of apparatus and wiring, which is *unique* and distinctive of **Cracraft Leich apparatus.**

Such *extraordinary* individuality is not based upon *one*, but a *number* of qualities.

Sound engineering thought and care have been spent upon *each individual part* of the apparatus composing the whole, making each part a unit of *high character* and the complete telephone a *standard* of excellence.

Only materials which experience has proven *best* for the particular work required are used. The tools and appliances employed in its construction are of the *latest design* in the art of modern manufacture. This insures a *uniform* and *well assembled* product and makes it possible to put this telephone upon the market at a *satisfactory price.*

SEND FOR FURTHER PARTICULARS AND PRICES

Cracraft Leich Electric Co.

GENOA, ILLINOIS

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IT ALL DEPENDS ON THE DATE

This Telephone Stands No Show

if you compare prices the first day or the first month or the first year.

Most any instrument costs less in the first place.

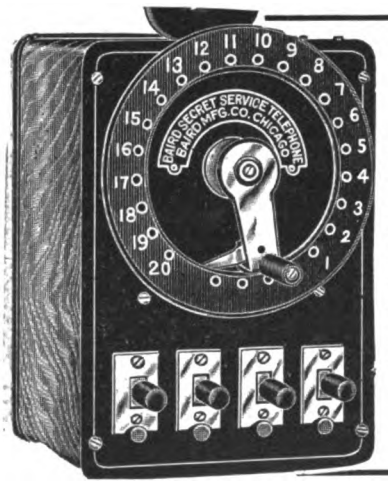
After the First Year

it begins to shine. And year after year as you figure the repair bills and livery bills on the telephones that cost less; and find no expenses on this one. You see wherein

But **Kwality Kownts**

like many other good things, the **Andrae Giant** improves with age, and the older it gets the better it gets. At the end of 5 years it is the cheapest telephone on the market. If you will look inside an Andrae Transmitter you will see the finest piece of workmanship ever put in a telephone. **¶ We are looking for critics.** If you are an experienced telephone man we want your opinion of the Andrae Giant and want to send you one to examine. ***Write us to-day.***

Julius Andrae & Sons Co., 48 Years In Business **Milwaukee, U. S. A.**



Operator's Calling Device

BAIRD PARTY-LINE SECRET-SERVICE TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

Write for Catalogue and Testimonials.

BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.

U. S. COMBINED

CASH REGISTER and PAY STATION

GIVE THE BEST SERVICE

Single Gong only A Cash Ticket with every collection

NO ERRORS CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.

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WHAT THE

"Duplex" Bridging Telephone

WILL DO

By turning the crank backward it will signal the switchboard secretly and without any instrument on the line receiving the "single tap."

By turning the crank forward, all bells on the line will ring but the switchboard drop will not respond.

No push-buttons or relays are required.

Operates on grounded as well as on metallic lines.

Will operate on lines now installed and in conjunction with every other make of instrument.

Write for Bulletin No. 10.

Long Distance Telephone Manufacturing Co.

Makers of "Better Telephones"

South Bend Indiana

Pay Stations PAY When They're Gray Pay Stations

Catalog No. 50 tells *how* and *why*. Every live telephone man needs it. Write for it NOW.

GRAY TELEPHONE PAY STATION CO.

HARTFORD, CONN.

WE MAKE TOLL TICKETS BY THE MILLION

By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
Toll Journals	Trouble Tickets
Toll Ledgers	Rental and Toll Bills
Monthly Check Reports	Voucher Checks
Cash Books	Card Index Systems

Steel Telephone Signs

All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY

DEFIANCE, OHIO

Tubular Fuse and Carbon Protection

UNIT TYPE

Mounting Plate

Buy frame, add protectors as required.

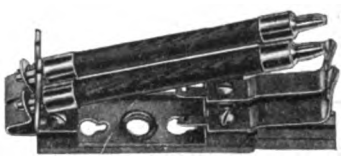

Plate with Fuses Inserted

Made for use in pole house.

No. 263

Unit Complete

STERLING ELECTRIC CO.

La Fayette, Ind.

GOOD GOODS

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"ROBERTS" AND WHAT IT MEANS

7 The system's advantages include Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, etc., and adaptability to any existing local battery exchange.

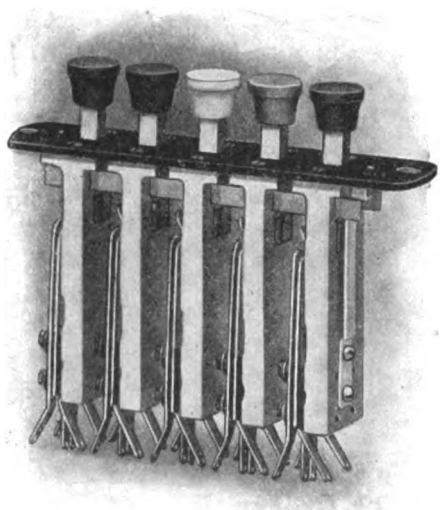
Central Energy Signalling

Central Energy accomplishes all signalling, just as in modern city practice. The subscriber who wishes to talk simply takes the receiver off the hook. This throws the line drop shutter at Central. The operator then gives the subscriber's bell a single tap and the subscriber can give his order. Whether party wanted is on the same or some other line, connection can be secured only through Central. Hanging up the receiver gives the disconnect signal. If receivers are left off the hook, Central would know it at once, and either ask the careless one to "hang up" or lock him out if he failed to respond, before giving connection to another on that line. His action does not enable him to interfere with the service nor to listen in, but the operator would ring his bell every time she runs down the line to restore or pick up signals until he does "hang up." The instrument cannot, in any way, be in talking connection without the operator's knowledge.

Think about this. Write for bulletins.

HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago

The Monarch Four-Party Master Key



This key—designed for our direct current four-party system—is so constructed that the pressing of any button releases any of the others. It is therefore impossible to have both direct and alternating currents on the line at the same time.

The contact springs are long and the strain of operation is distributed throughout their entire length. Hard rubber rollers act as bearing points against these springs and further reduce the wear.

Each group of contact springs is mounted on a separate frame and can be removed easily without disturbing the other groups or even interfering with their operation.

If interested in four-party systems don't fail to investigate our DIRECT CURRENT system. It has features which surely will attract you.

Let us send you a catalogue.

MONARCH TELEPHONE MANUFACTURING CO.

Factory and General Office
Washington and Morgan Streets, CHICAGO, ILL.

Branch House
177 Main Street, DALLAS, TEX.

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

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Lightning Injury and Responsibility.

Where a telephone company has taken all reasonable precautions to protect substation equipment it will have a good defense against claims for damage arising out of accidents occurring during thunder storms. The company is responsible only to the extent that it must provide protective equipment, and maintain it in condition, according to accepted standards.

An illustration of this recently occurred at Richmond, Va., where the law in equity court decided a case in favor of a telephone company which was being sued by a person who had used the apparatus during a thunder storm, and alleged that he had been permanently deafened by a stroke of lightning which hit the line while he was at the telephone. The negligence charged against the company was failure to connect its ground wire with the protector. The company introduced evidence tending to show that the ground wire was connected, and supported this evidence by showing that the fuse at the substation protector was blown and the carbons smutted. The testimony of three experts showed beyond reasonable doubt that this could not have occurred if the ground wire had not been connected. The storm in progress was terrific, and in accordance with the instructions at the central office, the operators left the switchboard. While they were away from the board, the plaintiff signaled the operator from the substation, which was located in a railroad yard; the operator deeming the signal one of importance, perhaps relating to a matter of life and death, attempted to answer it, when there came a tremendous crash of thunder. The operator sprang from the switchboard and the plaintiff fell to the floor as a result of the discharge on the line.

As soon as possible after the accident, the company sent repair men to the scene, and found the situation as above stated. Besides burning out the bell and receiver coils, the force of the discharge had been so great as to throw the diaphragm toward the pole piece of the receiver, sending the outer edge of the diaphragm against the earpiece and stripping it from the receiver. The impression of the pole piece and the end of the bobbin was clearly discernible, so that the court found it hardly conceivable that enough magnetic force could have been produced to affect the diaphragm in this manner.

Although the court has held that the use of a proper type of protective equipment, maintained in good order, absolves the company from legal responsibility in such a case, this only emphasizes the necessity for precautions against injury by lightning stroke. Experience has shown that, no matter what the protection between an open-wire line and an interior extension, a person in contact with the latter at the time the line is struck by lightning is liable to serious or fatal injury. It is a good plan for telephone companies to use a certain amount of persuasion to keep subscribers away from the instrument during severe electrical storms.

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Service and the Man at the Telephone

Results obtained in Milwaukee by the distribution, with each directory issue, of cards requesting telephone subscribers to send comments on the service to the office of the president of the company are briefly mentioned on another page. Probably a large number of our readers have noticed in recent numbers of the general magazines certain advertising of the associated Bell companies, apparently intended, among other things, to enlist the co-operation of subscribers in the improvement of traffic conditions. In our columns we have mentioned in times past not a few instances where the manager of a good sized Independent exchange makes a practice of talking about the service with nearly all his subscribers among business and professional men, going the rounds fairly often. Along the same lines, and perhaps a development of the latter simple and effective, but rather expensive plan, is the appointment by at least two companies operating in large cities of a so-called "subscriber's agent." This introduces a new type of telephone official, who calls upon a complaining subscriber and convinces him that the company is anxious to treat him well, and get irregularities straightened out—often requiring the active co-operation of the complainant for the removal of conditions due in part to his own ignorance or neglect of the proper use of the service.

All these signs point out a tendency toward more active efforts along a line of work which reasoning has indicated could be followed to advantage, but which practical men have not taken the time to develop. Of course, telephone companies sell service —but they do not produce it as a complete article is turned out by a manufacturer. The subscriber himself, in fact the two subscribers, located respectively at the calling and answering ends of the line, share in the responsibility and labor of creation. Experience has shown that either can do much to make or mar the quality of the service he and his correspondent receive. It is the modern idea that the average user of telephone service is too busy, or too heedless, to gather information and think logically about telephone service problems. At the same time, if he can get better results by co-operating with the company, in easy ways which are shown to him, and explained in an interesting manner, he is willing to make a trial. On the other side, as long as the subscriber is, in a sense, a producing partner, telephone managers believe it pays to try to educate him so that he may be able to hold down the job.

Detail and Perspective

The importance of attention to the details of business has been emphasized from time to time, and is as applicable to the telephone business as to any other, deserving the careful attention of every manager. In the larger plants much of the detail work must be left to numerous persons under the manager. Part of it may be planned by him in detail and its execution left to others; more of it must even be designed and executed by assistants. Yet the successful manager or superintendent should possess the ability to know what is going on, even to details, for often these may unmake a company.

In small exchanges the man in charge has the advantage, for he plans all the work and may do a large part of it himself. He is in a position to be sure that his desires are carried out and no details slighted. This may be the reason why some small telephone companies are more successful than certain large ones in handling most features of their business.

Admirable as is the pursuit of details, it has its bad features. Too close application to small things tends to make a man narrow. By continually dwelling on details the larger vision is lost. Things become distorted to the mental view, and a man loses his poise and self-command. The manager or superintendent is not alone in this. The very workman to whom falls the carrying out of details may be dwarfed by them if he allows himself to circle around them day after day. Yet he must pay attention to his work, for it must be "done right."

But while manager, superintendent and workman are carefully following their several lines of details, let them keep their minds on the general plan of the work, and on the possibilities of other things. The details themselves will profit by this general view, for one can tell better where they will fit and judge their relative importance.

The young man starting in the telephone business needs to be on the alert to keep from narrowing, and from getting discontented. His attention has to be given to the thorough mastery of many small things which go to make up a smoothly running exchange. Yet he should read and study to broaden his mind and make himself equal to any situation. When urged to attempt larger things, one young lineman said: "If I can learn to take care of an exchange like this (500 subscribers) it is the most I ever expect to do." Very likely that is his limit, but perhaps because he has made it so.

The telephone convention is a good place to forget small things, for the time being, and get the swing of the march of progress. It gets one out of the rut to see what others are doing—to see that there are other ways of doing things besides your own, and perhaps better. The improvements in apparatus, as well as new ways of getting and handling business, are an inspiration in themselves alone. They help one to keep in line with the best that is going on. Careful reading of good technical journals, and thinking about the news and technical articles—to see whether they really apply to home conditions—has helped many to keep in the front line.

If the man who, working with details, has become discouraged, will lift up his head and take a look around, he may get his bearings and be encouraged to do his best, cheerfully, to make the business a success.

The Gossip Season

Hot weather seems to be productive of an unusual variety of mental disorders in certain parts of the telephone field during the present summer.

Of course much of our trouble can be laid off on some of the newspapers, "which will print anything handed them." Add to an expanded rumor an attempt to bring out a significance which was not even suspected by the person familiar with the happenings at the foundation of the reports, and we have the first attack on our peace of mind. Then, too, the telephone situation, on a national scale, is perhaps somewhat complicated. Any attempt to perceive the influence on local conditions which we are told to look for as an important result of happenings a thousand miles or more distant, gives the average manager and investor a puzzle which, to say the least, makes it hard for him to tell whether his first answer is right or wide of the mark.

Meanwhile, most of us are figuring on filling the party lines, keeping up the collections, and a few other things of the sort. When the gossip season is over we shall find that the business pays fairly well and that its success depends on the talking done by the other people.

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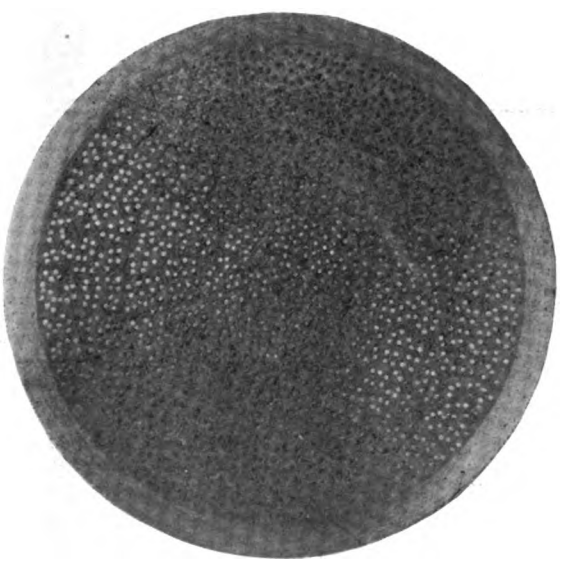
Special Telephone Cables in Great Britain

Several cables presenting novel points of design, adapting them to the various conditions to be met in the operation of its system in London and other places, have been developed by the engineers of the British Post Office. Through the courtesy of Major W. A. J. O'Meara, C. M. G., Engineer-in-Chief, the following information has been offered to readers of AMERICAN TELEPHONE JOURNAL.

In connection with telephone work in London the Post Office has found it necessary to make use of cables containing 1600 conductors, i. e. 800 pairs. The over all diameter of such a cable varies between 2.65 in. and 2.75 in. The mean thickness of the lead sheath is 140 mils. The lead does not contain any tin. The sheath should be capable of withstanding an internal air pressure of 75 lbs. per square inch. The conductors used weigh 10 lbs. per mile. Spiral, or longitudinal wrappings of paper, the minimum thickness of which is 2½ mils, are used for insulation, being colored red, blue, white and green for different wires. Two conductors insulated with similarly colored paper, but one wire being lapped with red and the other with white string, are uniformly twisted together to form a pair. The object of the string is to indicate the "A" and "B" wires of a pair; while the differently colored insulating papers indicate the length of lay with which the two wires are twisted together. The lays are 4, 5, 6 and 7 inches for the red, blue, white and green pairs respectively.

In stranding the cable a centre is made of four pairs, each of different color. Each succeeding layer contains six more pairs than the preceding one until the tenth layer, after which the layers increase by seven pairs. The last layer (the 15th) is increased by eight pairs. The sequence of the colors red, blue, white and green is maintained as far as possible. When the number of pairs in a layer is not a multiple of four it is usual to leave out a number of the white pairs. Between the stranded cable and the lead sheath a final wrapping of at least one thickness of the insulating paper is added.

The electrostatic capacity per mile of each wire, measured against all the remaining wires of the cable, and the lead sheath as ground should not exceed .115 microfarads. The

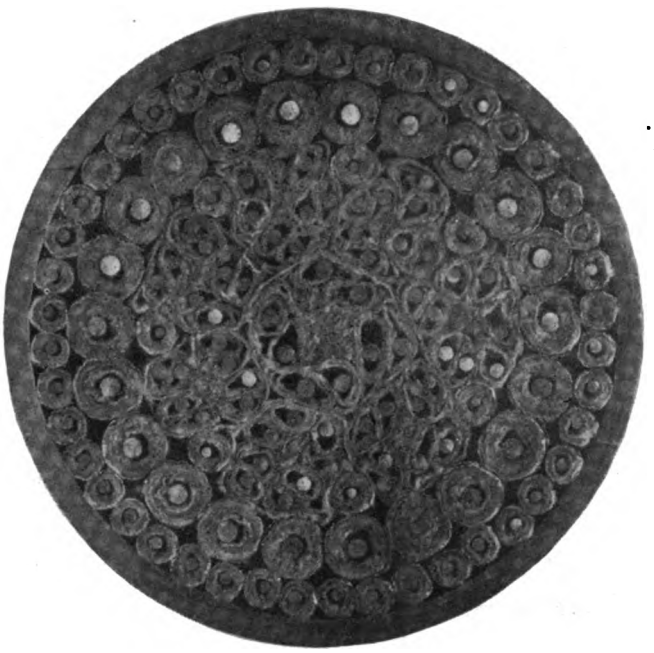


Cross Section of 800-Pair Telephone Cable Used in London. Illustration Made Approximately Actual Size of Cable.

mean electrostatic capacity from wire to wire of each pair in the cable (all the wires in the cable, and the testing battery and apparatus, being insulated) should not exceed 70 per cent of the mean wire to earth capacity.

The completed cable weighs 23½ tons per mile.

Composite telegraph and telephone cables are used on main underground lines to a considerable extent. The photograph shows a section of the cable laid along part of the route between London and the West of England. The cable contains 137 wires in all, made up of five different gages of conductors viz., eight weighing 150 lbs. per mile; fifty-six, 100 lbs.; twenty-two, 200 lbs. (screened); forty-four, 70 lbs. (screened); and seven, 40 lbs. (screened). All the wires with the exception of the screened conductors are stranded so as to form quadruple pair cores.



Cross Section of Composite Telegraph and Telephone Cable Laid Between London and the West of England, Approximately Actual Size.

The conductors to be made into a quadruple pair core are insulated and twinned as in the 1600 wire cable. The lays with which these heavy wires are twinned together are longer than in the case of 10 lb. conductors; for the 100 lb. pairs the lays are 7, 8, 9 and 10 inches, and for the 150 lb. pairs, 9, 10, 11 and 12 inches, for the red, blue, green and white pairs respectively. Four pairs of wires of the same weight conductor are stranded around a centre of yarn to form a symmetrical quadruple pair core. The order of stranding is such that the colors of the

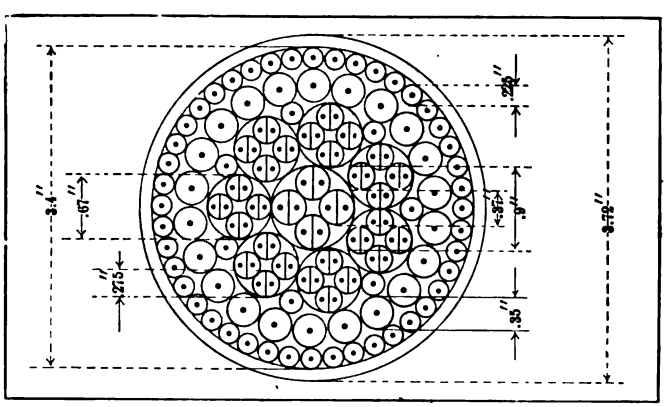


Diagram of Composite Telegraph and Telephone Cable Showing Arrangement of Wires and Dimensions.

diagonal pairs are red and white, and blue and green, respectively.

The quadruple pair core so formed is provided, over all, with a spiral wrapping of paper, colored red, blue, green or white. The color indicates the length of lay with which the quadruple core is stranded. For 100 lb. cores the lays are 12, 14, 16 and 18

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inches and for the 150 lb. cores, 14, 16, 18 and 20 inches. The diameter of the completed cores and the wire to wire capacities are shown below:

Weight of conductor in lbs. per mile.	Diameter of quadruple core, in mils.	Wire to wire capacity in microfarads per mile.
100	670	.06
150	900	.056

The screened conductors are insulated with three wrappings of paper, the first of which is put on longitudinally, and the

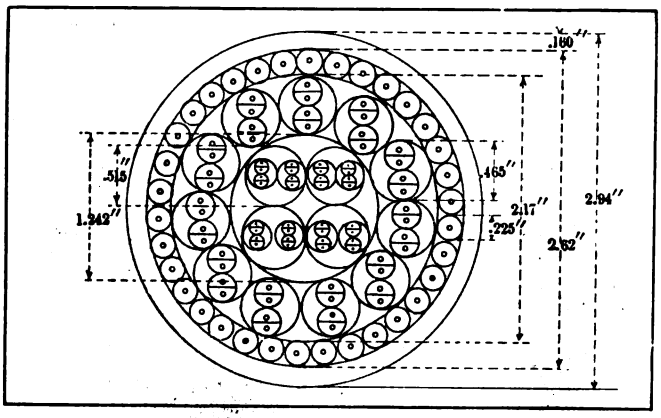

Diagram of Cable Containing: 44 Multiple Twin Conductors Weighing 150 lb. per Conductor Mile, Capacity 0.07 m.f., Wire to Wire; 32 Multiple Twin Conductors Weighing 100 lb. per Conductor Mile, Capacity 0.07 m.f., Wire to Wire; 34 Single Screened Conductors Weighing 70 lb. per Conductor Mile, Capacity 0.125 m.f., Wire to Ground.

others spirally. The core is completed by means of a helical winding of copper tape having an overlap measuring 30 per cent of the width of the tape used. The tape is 3 mils in thickness. The over all diameter and the capacities of the different sized screened conductors are given below:

Weight of conductor in lbs. per mile.	Overall diameter in mils.	Wire to ground capacity in microfarads per mile.
40	230	.095
70	225	.120
200	350	.125

The cable is stranded with the 150 lb. quadruple pair core in the centre and seven 100 lb. quadruple pair cores around it. The seven 40-lb. screened conductors are wormed in the interstices between the 100 lb. quadruple pair cores. Over them are

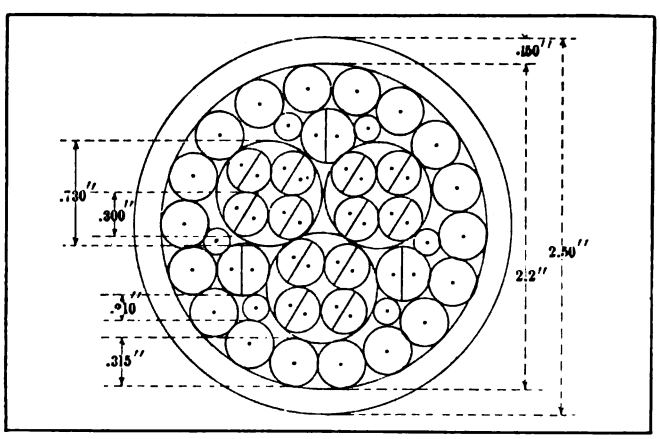

Diagram of Cable Containing: 24 Quad. Pair Conductors Weighing 100 lb. per Conductor Mile, Capacity 0.06 m.f., Wire to Wire; 6 Twin Conductors Weighing 150 lb. per Conductor Mile, Capacity 0.06 m.f., Wire to Wire; 6 Single Screened Conductors Weighing 70 lb. per Conductor Mile, Capacity 0.135 m.f., Wire to Ground; 18 Single Screened Conductors Weighing 200 lb. per Conductor Mile, Capacity 0.130 m.f., Wire to Ground.

placed the twenty-two 200 lb. screened conductors and finally the forty-four 70-lb. screened conductors. The copper tape of the outer layer of the screened conductors is in direct contact with the lead sheath. The mean over all diameter of the cable is 3.66 inches. The lead sheathing is 160 mils in thickness.

In splicing the cable differently colored quadruple pair cores and pairs (i. e. pairs and cores twinned and stranded with different lays) are connected together in order that the resistances of the circuits may be equal. If it be required to make up a circuit of conductor weight double that of a pair, the diagonal pairs are "bunched" (arranged in parallel). Diagonal pairs are also used for superimposed circuits. The capacity between diagonal pairs may be equal to, or 25 per cent greater than, that between two wires of a simple pair.

The multiple twin type of cable is much used by the Post Office. In this type each pair of insulated wires is twisted with another similar pair. The *A* and *B* wires of each pair may be bunched to form a pair of which the conductor weight per mile is twice that of the wires forming the component pairs. The process may be further continued, and one set of four wires twisted with another similar four-wire core, but for general purposes the simple construction of two-pair cores meets all requirements. The capacity per mile between one pair and another in this type of cable is from 25 to 50 per cent greater than between one wire and another in a single pair, depending upon the tightness with which the wires are packed in the cable.

For a given wire-to-wire capacity of the simple pairs in multiple-twin and quadruple-pair cables respectively, the latter has the advantage, in that by bunching the conductors the capacity is not increased to quite the same extent as in the multiple-twin type when a minimum increase of 25 per cent takes place. Considered, however, from the point of view of the number of

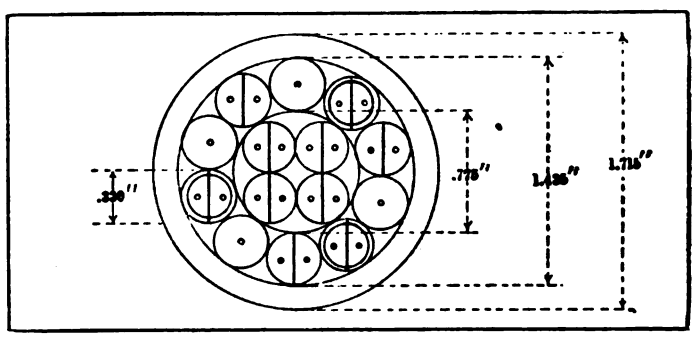

Diagram of Cable Containing: 8 Quad. Pair Conductors Weighing 150 lb. per Conductor Mile, Capacity 0.070 m.f., Wire to Wire; 6 Twin Conductors Weighing 100 lb. per Conductor Mile, Capacity 0.060 m.f., Wire to Wire; 6 Twin Screened Conductors Weighing 100 lb. per Conductor Mile, Capacity 0.150 m.f., Wire to Ground; 4 Single Screened Conductors Weighing 200 lb. per Conductor Mile, Capacity 0.150 m.f., Wire to Ground.

simple pairs of given capacity which may be formed into a cable of given size, the multiple-twin type has the advantage, owing to the fact that the space taken up by four pairs in the quadruple-pair is at least 30 per cent greater than in the multiple-twin form.

Long Distance Service for the Wheeling Board of Trade Excursion

By R. M. Dalzell.

Independent long distance lines of West Virginia received a test which demonstrated their fitness to serve the State on the occasion of the recent excursion of the Wheeling Board of Trade. On April 21, 1908, the members of this organization and their guests left Wheeling for the purpose of establishing closer and more friendly relations with fellow tradesmen out in the State. The party was composed of mechants, manufacturers and business men representing 55 of the most enterprising business concerns of the city.

The National Telephone Company saw in this excursion an opportunity to impress upon the 60 representatives of Wheeling that the territory covered had Independent service superior to that furnished by the Bell company and that these facilities were to be permanently at their disposal; and, incidentally, to convince the residents of every town along the route of the excursion that their local companies had connections to Wheeling and outside points that would enable them to transact all business they wished to do by telephone.

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The plan was to make the use of the telephone as convenient as possible and therefore apparatus and telephones were installed on the train. Instruments for magneto, and others for common battery systems were ready for service. The desk stands were placed on Pullman adjustable tables between the seats, an arrangement very handy for persons sitting on either side of the table. All the Independent companies along the route ran loops to the stations, so that quick connections could be made upon the arrival of the excursion train. Every member of the party was presented with a complimentary ticket which entitled him to free long distance service throughout the State. As it happened, calls were put through not only to West Virginia points, but also to many towns both in Ohio and Pennsylvania, and these were permitted to be covered by the complimentary tickets. The privilege of free service during the excursion was not restricted to the train telephones, but the tickets were honored at all Independent offices or at any station where the ticket number was given.

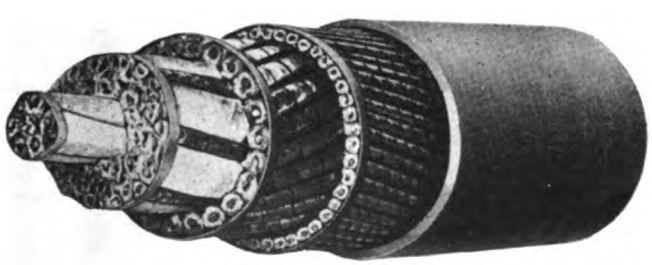
Members of the Wheeling Board of Trade on an Excursion Through the State.

The itinerary covered a triangular route with each side constituting a day's run. Leaving Wheeling at 8 a. m., April 21, the train followed down the bank of the Ohio River, stopping at seven towns, among them New Martinsville and Sistersville, and reached Parkersburg the first night. Next day the excursion traveled east to Elkins, having made eight more stops, including Clarksburg and Weston. The third day added nine more towns to the list, the larger ones being Grafton, Fairmont, Mannington and Cameron.

Wheeling was reached at the end of the third day, the train having stopped at 24 towns and covered 435 miles.

The novelty of telephoning over long distances from a moving train was experienced throughout the trip at many places, and made a great hit with the business men. At stations where the linemen had plenty of wire it was unreeled behind the train and conversation was prolonged for at least, in one instance, as much as two minutes after the engine pulled out of the station. Many of the men's wives in Wheeling would not credit their husbands when told they were talking from a moving train.

The precise method of making connections with the loops at each station may be interesting to telephone men. Ten feet of wire was attached to each of the instruments, and at the loose ends common testing joints were fastened. When coming into a station an assistant would be leaning out of the Pullman window with these test-joints in hand. The local linemen were hailed and directed to the proper window. The extremities of their wires were bared, of course, and were quickly inserted in the test-joints and the set-screws tightened. These connections were effected with such celerity that at a number of places someone on the train was talking with the Wheeling operator 10 or 15 seconds before the train came to a full stop. These records, it must be understood, were made where the linemen knew beforehand just where the train would be placed.



Arrangement of Layers in British Composite Cable.

Bell competition was not lacking during this excursion. Their equipment was installed on the train, as that of the Independent companies was, and they had three representatives on board while the Independents had but two. However. the Independents had an advantage over their competitors, due to giving train service at every station, including 10 and 15 minute stops, whereas the Bell had central office service only at these short stops. Owing to this condition the Bell company provided train service at only 12 towns, or just half the number of places visited. This, perhaps, explains why the Independent telephone service was more popular during the trip. Another point in its favor was the rapidity of making connections. At only three stations were their competitors ready for business before the Independent lines were in service.

In summing up, it is no exaggeration to say that the service on the trip was indispensable. Business men gave instructions as to how to answer correspondence after having the gist of their morning mail read to them over the telephone; heads of families kept in touch with their homes, and in cases where illness existed this service was especially appreciated.

The telephone men engaged in this enterprise felt that much was accomplished in the way of acquainting persons with the Independent telephone system throughout this section. It was proved to 60 up-to-date men of affairs that telephone service on trains is a practical proposition. As a result it is predicted that in this locality in a short time telephones will be on all first-class railroad systems, and that with connections furnished at all stops business men will eagerly take advantage of the service made available to them. But the greatest advantage of this demonstration was the proof of the completeness of the system, and promptness and reliability of the service which the Independent telephone companies of West Virginia are able to put at the disposal of the business men of the State.

Telephonic Development in Australia

A well-informed correspondent in Australia sends us a few interesting notes as to recent telephonic development there. He states that throughout Australia the demand for the last twelve months has been double that of any preceding years. This has been the result of the adoption by the government of the measured service system and rates which are very liberal.

In Melbourne the system hitherto in use was the old break-jack multiple single-wire magneto system, one of the first installed. Reconstruction work is now going on with common battery switchboards and underground distribution on modern lines. The same is being done in all the other State capitals. The first common battery board was put into operation in Hobart, Tasmania, some twelve months ago. The second is now being taken over in Sydney; others are on order for Brisbane, Adelaide, Port Adelaide, Windsor (Victoria), and tenders are being invited for yet further boards for Melbourne City, Hawthorn and certain branch exchanges in the Sydney network.

Speaking generally, the development which is taking place around the world is being experienced also in Australia.

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A Study of Multi-Office Automatic Switchboard Telephone Systems*

By W. Lee Campbell.

In endeavoring to form some conception of the methods used for introducing trunking of calls on a large scale between automatic offices, it is well to understand the difference between two general types of office that are being used for this purpose. One is known as a "substation" or "district" office and the other as a "branch" office. The difference lies in that a substation contains line switches and connector switches but no apparatus for making local connections; that is, every originating call is trunked to a distant larger office containing the selector switches, whereas a branch office contains switches of all classes and completes within itself all local connections demanded. It will readily be seen, therefore, that a substation requires more outgoing and incoming trunks than a branch office.

For an illustration of a system using substations attention is directed to Fig. 18, in which *A* represents a "main" office containing the equipment for 1200 lines. "*A*" contains also the first selector and second selector switches used by two substations *S*-1 and *S*-2. *S*-1 is represented as containing line switches and connector switches for 100 lines and *S*-2 is supposed to contain line switches and connector switches for 300 lines.

Calls would be handled as follows: Suppose, for example, a subscriber at telephone No. 2314, which is connected to substation *S*-2, to be calling No. 1527 connected to the main office A. The impulses sent over the circuit through the calling device of telephone No. 2314, would first operate a line switch at *S*-2, which would instantly extend the connection over an idle trunk to a first selector switch at *A*. This first selector switch would be operated by the impulses corresponding to the first digit "1" of the desired number, and, would extend the connection to a second selector, also located at *A*. This second selector would be operated by the impulses corresponding to the second digit 5 of the desired number and would extend the circuit to a connector switch in the "1500 group" at *A*. This connector switch would be operated by the impulses corresponding to the last two digits 2 and 7 of the desired number and would complete the connection to line and telephone No. 1527. Suppose again No. 2314 to be calling No. 2745 connected to the other substation *S*-1. A line switch at S-2 would be operated first, then a first selector and a second selector at *A*. This second selector would extend the connection over a trunk to a connector switch located at *S*-1. This switch would be operated by the impulses corresponding to the last two digits of the desired number, and would complete the connection to line and telephone No. 2745.

Suppose again, No. 2314 to calling No. 2536 connected to the same substation, *S*-2. In this case, a line switch at *S*-2 would, as before, extend the connection to a first selector switch at *A*. This switch would extend it to a second selector at *A*, which would extend it back over another trunk to a connector switch at *S*-2. This connector switch would complete the connection to line and telephone No. 2536. During such a conversation, therefore, two trunks would be occupied between the substation and the office through which it operates. This indicates that a substation is best adapted to a district where there is very little local telephonic intercourse, because every local connection occupies two trunks without any immediate benefit.

The substation is also especially adapted to a small isolated district where the expense of a constant local attendant would not be warranted, and, where it is, therefore, considered advisable to install the simplest apparatus obtainable, with arrangements for supervision from the main office to which the substation trunks are connected. Under almost any conceivable condition a substation will require more trunks than a branch office, for several reasons: first, all calls must be trunked; secondly, there is one group of outgoing and one group of incoming trunks for each 100 lines connected to the substation; thirdly, in order to provide thorough supervision from the main office, each outgoing trunk contains three wires instead of two.

It is, therefore, seen that in considering the advisability of installing a substation instead of a branch office, the increased expenditure for trunk installation and maintenance should be weighed against the saving in cost of supervision and attendance.

When the proposed office is to be a small one, and the trunks to it are to be secured by converting the line cable at present entering the new office district into a trunk cable, there is often no immediate advantage in economizing in the number of

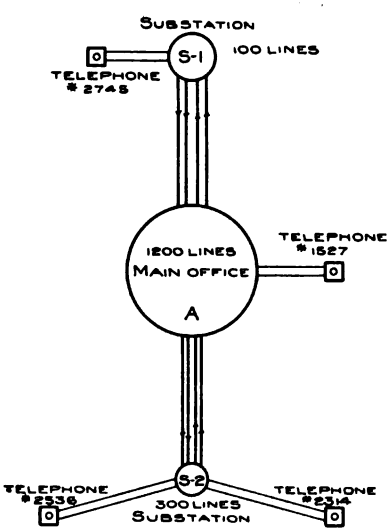

Fig. 18.—Main Office with Two Substations or District Offices.

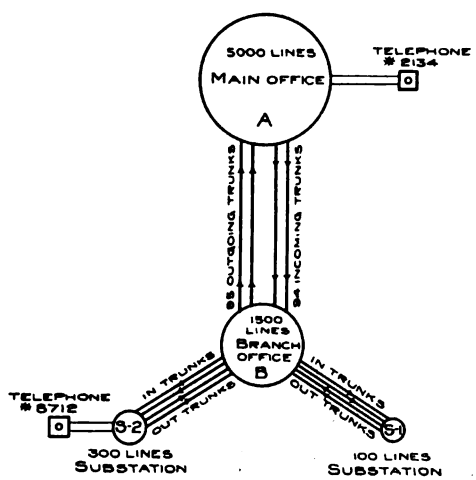

Fig. 19.—The Substation as an Auxiliary to the Branch Office.

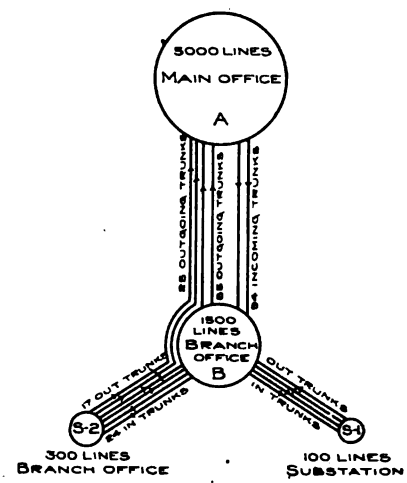

Fig. 20.—Increase of Trunks Caused by Making One Substation a Branch Office.

*Abstract of paper presented at twenty-fifth annual convention of the American Institute of Electrical Engineers; concluded.

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trunks. To such conditions a substation is well suited even if the trunks are long and consequently expensive. It would appear, however, that in the present state of the art such an auxiliary to a "main" office would rarely be warranted if it contained over 500 lines.

A substation may often be used to much better advantage as an auxiliary of a branch office; that is, a branch may be installed at the center of a comparatively large district so that all trunks going out from or coming into the district will terminate at the centrally located branch office, then shorter and more numerous trunks may be run from this office to substations located about it. As an illustration of this plan please refer to Fig. 19 in which *A* represents an office of 5000 lines, *B* a branch office of 1500 lines, *S*-1 a substation of 100 lines, and *S*-2 another substation of 300 lines auxiliary to the branch office. Calls would be handled as follows: Suppose, for example, that a subscriber No. 8712 connected to substation *S*-2 called telephone No. 2134 connected to office *A*. As No. 8712 operated his calling device his line switch at *S*-2 would instantly operate and connect his telephone over an idle trunk to a first selector switch in branch office *B*. This first selector would be operated as the subscriber's calling device transmitted the first digit (2) of the number being called, and would extend the connection of the calling telephone over a trunk to a second selector switch at *A* office. The second digit (1) transmitted from the calling telephone would operate this second selector and extend the connection to a connector switch also located at *A*. This connector switch would be operated by the last two digits (3 and 4) of the number called, and would complete the connection to the line and telephone No. 2134. It might be of interest to note in passing that the current for the transmitter of the calling subscriber would be furnished from the battery located at *B* and the current to the called subscriber's transmitter from the battery located at *A*. If the call should proceed in the reverse direction, that is, if No. 2134 connected to *A* should call No. 8712 connected to *S*-2, then the operation of a line switch and a first selector switch at *A* would extend the connection over a trunk to a second selector at *B* which would in turn extend it to a connector switch at *S*-2. This connector switch would complete the connection to line and telephone No. 8712.

Supposing the number of calls made per line per day in this 6900 line system to be 16, and the number of busy hour calls to be one-eighth of the total, and that the "community-of-interest" can in all cases be taken care of by the factor 0.75, then the number of incoming trunks necessary to *B* from *A* would be 94, and the outgoing trunks to *A* from *B* would be 95, a total of 189. This number is 9.9 per cent of the total of 1900 lines in the branch office district. The number of pairs of wires necessary for incoming and outgoing trunks, supervision, furnishing ringing current, charging substation battery and all other purposes between *B* and *S*-2 would be 78; that is, 26 per cent of the 300 lines connected to the substation, and between *B* and *S*-1 would be 28 pairs, which equals 28 per cent of the number of subscribers' lines connected to that substation.

In order to demonstrate the advantage that there may be in making the office *S*-2, for example, a substation instead of a "branch" office, the writer would direct attention to Fig. 20, in which is represented the same system as that in Fig. 19, except that the office *S*-2 is now considered to be a branch office of "B." *S*-2 would now contain first selector and second selector switches in addition to the line switches and connector switches. There would be no difference in the mode of operation so far as incoming calls to *S*-2 were concerned, but there would be a difference in the method for handling outgoing calls; also all local connections would be completed inside of the *S*-2 office. The principal difference in the outgoing connections would be that connections from *S*-2 to *A*, instead of passing through switches at *B* would be trunked direct from the first selectors at *S*-2 to second selector switches at *A*. The effect of this would be to increase the number of groups of trunks and consequently the number of circuits necessary between *A* and *B* districts, so that with the particular case illustrated in Fig. 20 the total number of trunks between *A* and *B* would be increased by 15, while a reduction of only 12 circuits would be secured between *B* and *S*-2. It is, therefore, readily seen that if the distance from *A* to *B* is equal to, or greater than, the distance from *B* to *S*-2, that the branch office scheme in Fig. 20 would require more trunk mileage than the substation scheme in Fig. 19. The writer believes that this fairly illustrates the advantage that there may often be in using the substation as an auxiliary of a branch office.

As an illustration of how trunking of calls is done in a larger automatic system, Fig. 21 shows a rough skeleton of a 50,000-line system. This contains five main offices, *A*, *B*, *C*, *D* and *E*, of which *A* has eight branch offices and the other main offices each have five branch offices. Since this system has an ultimate capacity of 100,000 lines, all numbers would have five figures, but, as is customary, in place of the first figure a letter is used, which not only makes the number easier for the subscriber to remember, but also designates the office to which the number belongs. It is supposed that the main office *A* contains equipment for 2000 lines, the numbers of which run from 1000 to 2999; and that each of its branches contains equipment for 1000 lines, the numbers in *A*-3 running from 3000-3999, in *A*-4 running from 4000 to 4999, etc. Each of the other main offices is also supposed to contain equipment for 2000 lines, the numbers of which run from 1000 to 2999 in each. Of course, there

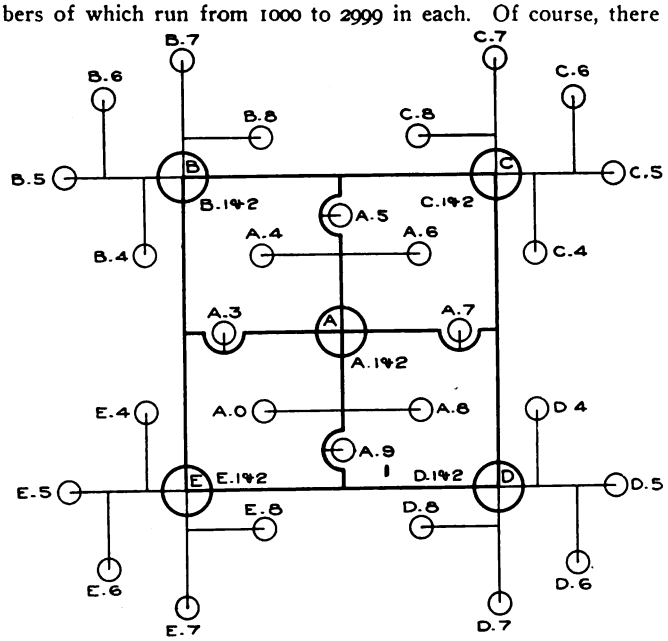

Fig. 21.—Skeleton of Divided 50,000-Line Automatic System.

is a letter prefix to each number corresponding to the office to which the number belongs. Each branch of the offices *B*, *C*, *D* and *E* is supposed to contain 1000 lines. The numbers in *B*-4, for example, run from 4000 to 4999, those in *B*-5 run from 5000 to 5999, etc.

Connections in the system would be handled as follows: Suppose a subscriber *E*-7234 connected to branch office *E*-7 called *A*-5124 connected to the branch office *A*-5. The first movement of the subscriber's calling device would operate his line switch and connect his line to an idle first selector in his own exchange, *E*-7; then when the calling device sent in a number of impulses corresponding to the No. *A*, his first selector would be operated and would pick out an idle trunk to a second selector in exchange *A*. The second set of impulses corresponding to the figure 5 sent in by the calling device would operate the second selector at *A* and extend the connection over an idle trunk to a third selector in the office *A*-5. The next set of impulses corresponding to the 1 of the desired number would operate a third selector at *A*-5, which would extend the connection to a connector switch in the proper "100 group" at *A*-5. This connector would be operated by the impulses corresponding to the last two digits of the desired number and would complete the connection to line and telephone *A*-5124.

It may be noted that on this call the connection to *A*-5 passes

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through the main exchange *A*. This would be true of every call incoming into the *A* district; that is, all trunks incoming into the district would terminate in second selectors in the *A* office. These second selectors would extend each incoming connection to a third selector located at the *A* main office or at the branch corresponding to the thousands digit of the particular number being called. This concentration of the incoming circuits simplifies the trunking arrangement and also reduces considerably the number of trunks entering the district, because the number of groups of incoming trunks would be nine times as great if each of the nine offices received its calls, coming from outside the district, direct instead of having them come through the main distributing office *A*. It should be noted on the other hand that the outgoing call from *E*-7 does not operate any switch at its main office *E*. It would probably be preferable, however, to have the trunk pass through the cross connecting frame at *E*. In a similar manner all outgoing trunks from each of the branch offices of *E* district could be terminated on the distributing frame at *E*, and there be cross-connected to what might be called a "through trunk cable" to each of the other main offices. If a subscriber connected to any office in the *A* district should call a number connected to an office in *E* district the incoming trunk to *E* district would terminate in a second selector switch at main office *E*, and would be passed on by it to the desired branch office or thousand group. In the skeleton diagram no trunk cables are shown interconnecting the branch offices of a district; for instance, no interconnection is shown between *E*-6 and *E*-7. If desired such trunks could be put in, or the outgoing trunks from all the branch offices of *E* may, as already stated, be run to the main central office and there be cross connected on a distributing frame. This would in many cases be the most economical arrangement, because with division carried to the extent that it is in this diagram the number of trunks required between *E*-6 and *E*-7 would be comparatively small. A call from a subscriber at *E*-7 to a subscriber connected to *E*-6 would operate a line switch, first selector and second selector at *E*-7 and a third selector and connector at *E*-6 so that it is not necessary that the connection should pass through the main office *E*.

If a manual system should be divided up in the manner shown in Fig. 21, supposing for the moment that such a division would be practical with equipment of that type, then the branch office *E*-7, for instance, would have 32 different groups of outgoing trunks; that is, one group for each of the other offices in the system, and would have the same number of groups of incoming trunks. With the automatic branch office arrangement, *E*-7 has but 10 groups of outgoing trunks; that is, one group to each of the other district main offices and one group to each other "thousand section" in use in its own *E* district. *E*-7 would have but five groups of incoming trunks; that is, one group from each of the other offices in the *E* district. It is seen, therefore, that by using the main offices at centers of comparatively large districts and then surrounding each main office with smaller branches, all subscribers' lines may be made very short and the use of the "through" trunks between the main offices for interconnecting districts makes the trunking system comparatively simple.

It is probably unnecessary to add that in planning such a system as is represented by Fig. 21, a careful engineering study should be made for each branch office to determine whether the trunk mileage required would make a "branch" office or a "substation" the most economical arrangement.

One of the peculiarities of the telephone business, especially when there is competition, is that an operating company is compelled to take on the new business offered. It must keep up with its rival or drop out of the race. A user of electric light doesn't care how many other customers are connected to the same plant that he is, but a telephone user is, of course, very much attracted by the larger of two lists of subscribers. Unfortunately a one-office plant is somewhat like a water or gas plant, in that new customers cannot be constantly added by simply connecting their service pipes to the mains originally installed. Some day a point is reached when the mains are supplying all the flow of which they are capable and it is necessary to go back to headquarters, dig up the streets anew, and put in more mains or larger ones. So in a one-office telephone system, if the growth is more rapid than anticipated, as it often is, or if the growth of the city takes place in an unexpected direction, as it frequently does, it becomes necessary to remodel the cable and wire plant to suit the new distribution of business.

A one-office telephone plant sometimes must be almost entirely rebuilt within a few years of its installation in order to adapt it to a shifting of population, or to make it adequate for the customers unexpectedly demanding service.

With a multi-office automatic system this need not be done. If an unexpected demand for telephones develops in a certain section of the city, it is not necessary to put in more conduits and cables or to replace present cables with larger ones to take care of the demand, but the situation is readily and practically met by putting in a substation or a branch office in the congested district. The present line cables running to the district may be used as trunk cables to the new office. Thus the traffic carrying capacity of the cable and conduit plant reaching any district may be greatly multiplied without any additional expenditure for cable or duct. Consequently, one of the most attractive features of an automatic multi-office system is that it affords a stable value to the investment in wire, cable, and conduit.

Encouraging the Spirit of Economy Among Telephone Employees

The following is a plan intended to show in a clear way to instrument setters and troublemen just what it means to a company when they are wasteful of material supplied them for doing work:

WHAT THINGS COST.

Pins	1½ cts. each
Brackets	1½ cts. each
Glass	1½ cts. each
Knobs	½ ct. each
Screws	½ ct. each
Machine bolts	5 and 10 cts. each
Carriage bolts	1 ct. each
Lag bolts	1 ct. each
Braces	5 and 7 cts. each
No. 6 and No. 9 iron wire	5 and 7 cts. per lb.
No. 12 and No. 14 iron wire	4 cts. per lb.
K. K. wire	12 cts. per lb.
Bridle wire	3 cts. per ft.
Copper wire	30 cts. per lb.
Duplex wire	1 ct. per ft.
Copper sleeves	3 cts. each
6-pin arms	25 cts. each
10-pin arms	45 cts. each
Dry cells	15 cts. each
Condensers	$1 each
Receiver shells	17 cts. each
Receiver caps	3 cts. each
Transmitter mouthpieces	8 cts. each
Receiver cords	13 cts. each
Extension cords	25 cts. each
Staples	15 cts. per box

This is a very small list of materials in almost daily use. *But* everything you use has a price. IT COSTS *MONEY*.

HEREAFTER.

Hereafter the instruments, stock, materials, tools, etc., belonging to this company will be considered and accounted for the same as *money*. If taken out by any employee, they must be accounted for on the "voucher" provided, properly and accurately. Proper and economical use of them in every way will also be considered. Any deviation from this rule will not be passed over lightly nor a repetition countenanced.

Workmanship with *proper tools* and a knowledge of the work in hand will be the best evidence of qualifications for your positions. *This is actual money paid for value received only.*

INTERLAKE TELEPHONE COMPANY.

This notice was prepared on an ordinary typewritten sheet for posting in the exchange of the Interlake Telephone Company at Canandaigua, N. Y., by Manager W. J. Kibbe. It will be seen that the prices, which are only approximate, give a reason for the final injunction in the heading, "Hereafter."

The final sentence in the first paragraph seems to be a very appropriate "word to the wise," which Manager Kibbe no doubt has methods of his own for following up.

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Trouble-Shooting in Moscow, Russia

A Bit of History of the Telephone Business in That Country. Translated from a High Official's Report to His Directors, by "Noleye."

After the political strike of Oct. 28, 1905, all the operators returned to their work with the exception of 43, the latter preferring to set up a number of conditions before resuming their service again. These included, among other demands, that an operator should receive her full salary as a pension after 15 years service, and that the Operators' Society should have a right to demand the dismissal of any employee or even member of the board of management. These demands naturally could not be granted, and as the 43 operators, disregarding a written notice, failed to report for duty, their places were filled with new ones.

For three following weeks nothing was heard of these operators. On Nov. 22 a newly organized society, composed of telephone employees and workmen, the president of which was a certain line engineer by name of Bagaturianz, presented a written demand that the company should take back into its service the 43 operators and that the new ones engaged to take their places be dismissed.

During the night from Nov. 22 to 23 all the cable boxes set up in the streets were opened with false keys and all the subscribers' lines were made unserviceable by stealing the connecting pieces. According to advertisements inserted in the newspapers this was done by the above society.

The following day, Engineer Bagaturianz, the greater number of the engineers and employees in their department, as well as all the foremen and workmen, stayed away from their work. When I received the telegram I immediately left Stockholm for Moscow with two engineers. I arrived on the 27th. The interrupted lines were then put in order again with the aid of soldiers.

The strikers' efforts were now directed to other means whereby they might cripple the telephone service. They attempted to prevent the operators from coming to the Central, partly by using brutal force, partly by threats through the telephone that they would blow up the Central Office Building if the girls should continue to work. In consequence of this about 80 operators failed to report for service and were immediately replaced by new ones.

It now became necessary to let the operators board in the building, to prevent the strikers from reaching them. Three hundred mattresses, blankets, pillows and sheets were bought, sleeping places were arranged and provisions were stored up in the Central Building. On the night of Tuesday, Nov. 28, 96 operators remained in the building, and this number increased each night until at last 250 operators had their full board and lodging in the building. Besides these, there were also 50 telegraph soldiers accommodated, who helped make connections in the switchroom, and about 20 soldier-mechanics, who helped to repair the outside lines, and the guard of soldiers doing sentinel duty, which run up to about 60 men. All these had to be provided with meals and rooms.

Not being successful in their attempt to draw away the operators from the Central, the strikers again directed their attention to the destruction of the lines, either by breaking into the distributing boxes and stealing the fuses from the lines or by cutting the bridle wires on poles and fixtures, and finally by cutting the cables themselves. Everything possible was done to repair the damages to the lines promptly. New troublemen were engaged to the number of 45, and these, together with the 20 soldier-mechanics, were placed under the orders of five engineers and used exclusively for repairing the lines.

The local authorities tried to lend the company as much protection as possible in their attempt to keep up the telephone service, but inasmuch as they were very much taken up in maintaining order all over the city their aid was not very effective.

Eight persons were arrested while in the act of destroying telephone lines.

On Dec. 7 Engineer Bagaturianz was arrested. His arrest took place the day after making a speech in a meeting of the striking post office employees, in which he explained how he, with the aid of his society, had destroyed the telephone company's lines. According to the declaration of the detective police a search in his private apartments brought out complete proofs that he had given the orders to damage the telephone installation.

Two days later he was released by the judge of instruction under bail, which his society put up for him, until his case should be taken up again, for, as the court declared, he should surely be condemned according to the strict law covering the interference with telegraph and telephone lines.

During the time he was in prison, the damage to the lines ceased. With his release the destruction began with renewed force, and now manifested itself in a perfect hunting-down of our engineers and workmen who attempted to repair damaged lines.

Thus on Dec. 12 two of the company's engineers, who were occupied in finding troubles, were attacked by an armed mob and beaten. The next day three men similarly occupied were also attacked and driven from their work. Hardly a day passed, now, that some outrage of this kind was not committed. These attacks were decided in the meetings of the society and carried out by armed groups, either members of the society (male and female), schoolboys or roughs hired for the purpose. The strikers did not recoil from any means to carry out their purpose. They visited the homes of the workmen and threatened them with the killing of their wives and children if they did not stop work. The parents of the telephone operators were threatened in a similar manner in their homes.

It soon became apparent that no result could be reached with the strikers, unless Bagaturianz was again arrested. I therefore went to St. Petersburg and through the aid of the Swedish Minister, Count Wrangel, who immediately expressed his readiness to help the company, I obtained an audience with the Minister of Interior, Durnawo, who promised to lend the necessary help. When I returned next morning to Moscow and paid a visit to the newly appointed Governor-General Dybassow, the latter advised me that Bagaturianz had been arrested that same morning on the strength of a telegraphic order from Durnawo. It seems that he had been living under a false name, and that it was therefore difficult to find him.

Prospects for the end of the strike now became somewhat better. The workmen, who began to tire of the strike and were convinced that the society's aim was not to better the workingmen's condition, but in reality to organize a revolution, now clearly showed their dissatisfaction with the leaders of the organization. First the trouble-shooters withdrew from the society and asked to be taken into the company's service again. Also two groups of men in the outer districts were willing to take up their work again. But the prospects of the end of the strike came almost immediately to naught, when the general strike was proclaimed over all Moscow. This brought troubles of a new and different kind upon the company.

The general strike, which was proclaimed on Dec. 20 at 12 a. m., soon changed into open revolution. The revolutionists' intention was, first to take possession of the Nicolai Railroad and thus interrupt communication with St. Petersburg, then take the Imperial Bank, and, finally, take the Governor-General

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as a prisoner. After this a new government was to be set up and the strike to close.

Already, on Dec. 22, the revolutionists had begun to build barricades in the streets, and on the 23d the battle began in full earnest. As the military force in the city was proportionately small, the revolutionists were enabled, in the beginning, to develop their fighting forces and strengthen their positions without opposition. For nearly a whole week the city was in their power, and hundreds of barricades were put up in Sadowa Boulevard and in the streets outside of this thoroughfare. The greatest part of these barricades were made up of overthrown telegraph poles and telegraph wires which were strung across the streets. In certain places these were reinforced by means of iron doors, iron fences, grates, planks, etc. In two city districts street cars were used, which were taken out into the street and heaped across the street crossings. The company's cable boxes, telephone kiosks and even iron distributing poles were utilized for the same purpose.

The troops now began to make use of guns to clear the streets and destroy the barricades. From Dec. 23 till New Year the battles continued, and each day became more furious. The military force obtained reinforcements from Petersburg and Warsaw, and the strikers were gradually driven to the outskirts of the city. The number of dead given in the Swedish papers seems, however, somewhat exaggerated. At night the sky was glaringly red from burning buildings, set afire either by the shells or by the revolutionists. Many other houses were badly damaged by cannon shot.

To think of keeping up trouble-shooting in the outside system during the days of the revolution was naturally out of question; we had to content ourselves with keeping track of the damages done. But already on New Year's Day, when fighting closed, line repairing began and it is hoped will finish in about a month. With the suppression of the revolution the strike against the company ended of itself.

The leaders of the telephone strike evidently took a very lively interest in the revolution. Two of them were killed in battle, two others wounded seriously. Two operator girls, who worked in red blouses, were killed; eight others were taken prisoners.

The Governor-General, finding the telephone to be an important factor in establishing communication between the revolutionists, issued an order on the 24th forbidding all private communications, permitting only the police, military and other authorities to obtain connections. When I left Moscow on New Year's Eve this order had not yet been withdrawn.

As an illustration of how things stood when I left, I will add that when I drove to the railroad station in a sleigh, about 9 p. m., a distance of about half an hour's ride, we had to get out of the sleigh twice and were visited and examined by military patrols. On the whole route we did not meet one solitary person, and only one sleigh. The railroad station, generally so full of life, was without passengers, but crowded full of soldiers.

There were only six passengers on the express to Petersburg.

Rural Telephone Service in New England Stimulated

The New England Telephone & Telegraph Company (Bell) has recently taken aggressive steps to extend its rural telephone service by offering to sparsely settled communities a new plan for the establishment of service at an exceedingly low price per year. The plan of the company does not do away with any existing service rates, if any subscriber desires to avail himself of them, but supplements the previous means of securing telephone service in small and scattered communities. The plan proposed contemplates the ownership or lease of poles, wires, instruments, etc., by neighborhood groups of telephone users, such lines and instruments to be connected with the switchboards of nearby exchanges in the general telephone service of the New England company.

The company's proposition is that six or more individuals, in a neighborhood not less than one, nor more than 10 miles from a central office of the company, may have communication with all the subscribers connected with that exchange, not including pay stations, for 55 cents per month for residences, and 70 cents per month for places of business. Apparatus and instruments will be sold at the lowest market prices, or if preferred the company will lease to subscribers complete sets of instruments at $2.50 per year each. Subscribers are required to build and keep in repair their own lines, but if preferred the company will do the work at actual cost. When, in the opinion of the company, it is practicable, wires may be supported upon the company's own poles at a reasonable charge per year. This proposition applies to exchanges in towns or cities having not more than 20,000 population.

In order to facilitate the work of farmers and other inhabitants of rural sections who may wish to take advantage of this offer, the company has prepared a small pamphlet setting forth the plan of this service and giving the amounts of material required for pole lines and subscriber's station equipment. For pole lines the company states that one mile of double wire or metallic circuit requires two miles No. 12 B B double galvanized iron wire, 32 poles, 64 oak brackets, 64 glass insulators and 128 wire nails for fastening brackets.

The standard pole used by the New England company is of cedar or chestnut 22 to 25 ft. long, and five or more inches in diameter at the top. Poles of this stock and size are used because of the greater economy of using the best material in the long run. Oak, hackmatack, spruce or hemlock poles, cut at the right time, are considered admissible for rural line construction, also. Poles of this character are spaced about 176 ft. apart, or 32 to the mile. The company points out the need of closer spacing at curves, road crossings, etc., with bracing and guying. It recommends cross-arm construction where more than two wires are to be used.

For each telephone set on a metallic circuit the company recommends about 200 ft. of bare or weather-proof iron line wire or braided rubber covered copper wire, from line to house; 30 ft. No. 18 B. & S. rubber covered and braided copper wire to connect the drop wires to the protector; 15 ft. No. 18 B. & S. rubber covered and braided copper wire for the ground; 15 ft. No. 19 B. & S. paired rubber covered and braided copper wire to run from protector to telephone set; 12 porcelain knobs for fastening wires to outside of house; three porcelain tubes for bushing wires through wall or window frame; one protector, one complete telephone set, three dry cells and one ground rod.

Regarding maintenance, the company states that if telephone sets and supplies used on rural lines are selected with care and are of proper quality, they will with proper installation require but little attention. Good equipment means low maintenance cost and reliable service. The company states that dry cells will need to be replaced about once in six or eight months. Insulators, fuses, brackets and poles are neither expensive nor difficult to replace, and the trimming of trees and removal of broken limbs are every day matters to the farmer. After a short time the subscriber on a rural line becomes familiar with the line in his vicinity, learns the place where trouble occurs oftenest, and is generally able to go and clear it in a few minutes.

The company is prepared to supply full information as to the business part of the subject, and offers to furnish a simple and effective contract form to those interested, or a blank copartnership agreement. No expense is attached to this. The services of managers of near-by exchanges and construction men attached thereto are available in any bona fide project, in the laying out of lines, estimating of costs, giving advice as to poles, apparatus, instruments, the experience of others, etc.

The charge quoted by the company covers the cost of switching, and it is arranged on the basis of the fact that many farmers do not object to the time taken to maintain their lines, since this often can be adjusted conveniently in relation to other work, whereas the expenditure of several dollars at a time often looks more formidable. The farmer is on the ground, and can naturally make simple repairs at a less expense

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than the company, which may be obliged to send a man several miles to adjust a trivial fault, at a corresponding cost and delay. The same point makes it an advantage for the farmer to construct his own line in spare time, and as far as possible, from materials on his own premises. For those who do not care to take any personal supervision of their lines, the average charge of about $18 a year per telephone for rural service is available.

Under the rates in force for rural service, the telephone is gaining a strong hold in the country sections of New England. Up to a few years ago the only telephone facilities in any of the hill towns of western Massachusetts, for example, comprised a single public pay station, usually in the store at the "Corner," seldom used by anybody, and never by most of the inhabitants. Now, as a result of canvassing, the farmer in the isolated hill town, a dozen miles from the railroad, may sit by his own comfortable fireside and hold communication with any city or town desired.

The coming of the city boarder to rural New England has been a powerful factor in the introduction of telephone service. Often the city man's family spends the summer on a farm in the Berkshires or the White Mountains, leaving him at home. With a city telephone at his place of business there is immediate call for communication with the absent family, and country people taking city boarders seldom fail to advertise their telephone service if their farm includes a set. The farmer who markets in the nearby town realizes more and more that to secure the best advantages he must be in constant touch with the current prices. Formerly he started for town with a load of produce, usually before daylight, trusting to his good luck to sell it, though perhaps not knowing where any of it was to go, realizing only too well that his chances of selling at a profitable figure depended chiefly upon his reaching the market in advance of his neighbor. The telephone enables the trip to be one of delivery only, with anxieties omitted, and often avoids the need of an unreasonably early start. Daily weather reports have done much to render this service valuable in New England, where it is safe to say the weather is more changeable than in any other section of the country.

Another means which has largely contributed to the spread of the farm telephone idea in this section has been the plan inaugurated by the company of sending out a lecturer among the remote country towns to demonstrate the workings of the telephone. A public meeting is called, often under the auspices of the Grange, or other local organization, a telephone instrument is set up, explained and demonstrated, while a set of lantern slides shows its use and application in many special cases, possibly including views of some of the city exchanges in the vicinity. To cap the climax, every person in the audience is invited to call for any friend in New England with whom he would like to talk, free of charge. Scores of such demonstrations were given by the New England company in the hill towns of its territory a year or so ago, and the result was the installation of telephones in many localities which had previously been without any local service whatever. It is shown by experience that probably from 95 to 98 per cent of the farm telephones stay, when once installed, and even change of farm ownership seldom means the withdrawal of telephone service, as the new occupant is glad to retain the instrument.

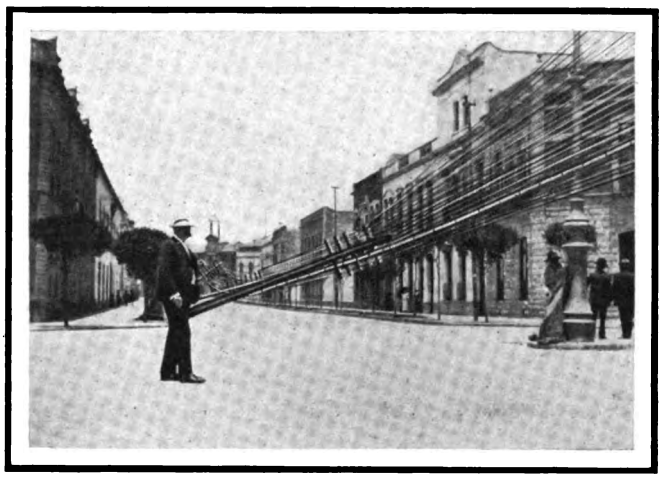
A Hundred Dollar Conversation

Probably the most expensive long distance telephone message ever sent from Paducah, says the *Cumberland Telephone Journal*, was when a representative of the Mayfield Water & Light Company talked for one hour and thirty minutes over the long distance telephone of the East Tennessee Telephone Company. The bill for the message was $106.50, the largest ever paid to the local office for one message, and probably a record-breaker.

Machinery was ordered for the water and light plant of Mayfield, which was destroyed by fire several weeks ago. A stenographer was on the line, and she took down the order in shorthand. Owing to the specifications of the machinery it was a difficult message, but it was received correctly at the other end of the wire. The line ran from Mayfield to Paducah, where it was switched to St. Louis, and from there to Indianapolis. From Indianapolis the message went to Pittsburg, and from there to Hazleton, Pa., where it was received. The line was over 1000 miles long. The message was difficult, as there were many figures, but on repeating the message, it was found to be been received nearly correct.

Telephone Construction in the City of Mexico

Since the Independent telephone company entered the City of Mexico, telephone conditions have been greatly improved. For nearly fifteen years the opposition company had had its own way and its system had not been kept up to date. It has for some time past been improving its system by placing



An Overloaded Pole Line in Mexico City.

its most central lines underground, and then continuing the cables on the old pole lines. Some of these pole lines were already overloaded, and the illustration shows the effect produced when the aerial cable was strung on one of the lines. One morning, in May, the line was found in the condition shown for a distance of nearly two blocks. Fortunately the electric light poles in the middle of the street prevented the telephone wires from falling completely to the ground.

To place the lines again in service the stumps of the poles were dug up and the tops of the poles reset.

Dispatching Trains by Telephone *

By S. L. Van Akin, Jr., *Assistant Superintendent Telegraph New York Central Lines.*

To dispatch trains successfully by telephone it was necessary for the pioneers, on account of the imperfect nature of the work, to do considerable engineering in bringing about a departure from established precedent, both in the method of construction and in operation.

Defects in local battery telephone sets, from a service standpoint, were carefully considered, some of which are as follows: When a receiver is left off the hook, the bridging bells on a party line cannot be freely operated on account of the short-circuit, and in case two or more parties are wanted, the first party called is obliged to "hang up" until the other stations are signaled. As sometimes found, the insulation on the hook becomes carbonized, thus failing to cut the receiver out—or only partially out—cutting down the ringing of bells, while it would not noticeably cut down transmission.

When the receiver is removed from the hook the transmitter circuit is closed as well as the receiver circuit, which oftentimes will cause interruption to communications between other

*Discussion before the Association of Railway Telegraph Superintendents, Montreal, June 24, 1908.

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offices on the line, due to speaking before listening, vibration from telegraph instruments, engine whistling or ringing balls, or noise from passing trains.

To obviate these objectionable features it was recommended that a 2-m.f. condenser be placed in the receiver circuit; and about the time the New York Central was ready to place an order for equipment we were able to obtain receivers of 700 ohms resistance. The 700-ohm receiver was wired in series with the secondary winding of the induction coil (which is standard practice) and a 2-m.f. condenser across the line brought the bridging resistance of the set, when operative, up to approximately 970 ohms. With 20 or more stations so equipped, and cut in circuit, it was found that as many bridging bells in series with a 2-m.f. condenser would freely operate.

To prevent interruption to communications between other officers when listening in, it was recommended that a line key and a transmitter key be installed at the outlying offices, the line key being locking, the transmitter key non-locking.

In this particular class of work it is essential that an operator have the free use of both hands; it was, therefore, deemed expedient to design a telephone arm having mounted upon it a transmitter and a receiver. With a transmitter and receiver mounted in a fixed position on an arm it follows that if the ear is pressed to the receiver, the mouth is brought close to the transmitter mouthpiece, insuring good transmission. Head telephones were not recommended for use except by the train dispatcher, who wears a chest transmitter, on account of the wear and tear on the cord, the liability to breakage and a tendency not to speak directly into the transmitter with this type of apparatus.

Bridging bells were installed at every third station for emergency use only, as it was not advisable to use ringing current on the line except as stated (for emergency calling) for the following reasons: The first, and most important, is the liability to demagnetize receivers. In this respect we have experienced considerable trouble at Ravenna, N. Y., which is the monitor ringing station for our long distance telephone lines. The receiver at that point is demagnetized and a new receiver required on an average of every 30 days due to ringing in the wire chief's ear. Second, ringing in operator's ear. Third, confusion of bells ringing incessantly where the lock and block signal system is in use, as in our case. Fourth, a bridging bell would be required at each station on the line, tending to cut down transmission.

With the above in mind it was recommended to install the Gill telegraphic selectors on the old dispatching Morse circuit and to provide automatic sending keys at the dispatcher's office. This was done, but proved a failure, first, being too slow; second, unreliable, due entirely to outside interference in breaking up the combinations. After much experimenting and hard work by all concerned the Gill telegraphic selector, new type, was finally installed, being the third installation tried out. It is operated over the telephone line, the service being very satisfactory and the operation absolutely reliable.

Arrangements are now being made to extend the original circuit to Little Falls, N. Y., with an additional eight stations, making a total of 25 stations, with circuits 73½ miles in length.

Our experimental circuit between Albany and Fonda, 44 miles long, was ready for service Sept. 29, 1907, but was not made operative until Oct. 2, as the railroad company was able to meet the conditions of the nine-hour law (New York State, effective Oct. 1, 1907) with telegraph operators and for obvious reasons it was thought best to commence operations by telephone after the conditions of the law had been met.

The spirit of antagonism toward telephone train dispatching has been very pronounced with us from time to time during the past nine months, but the issues have been successfully met. I appreciate this opportunity to endorse what Mr. Ryder has said with regard to the practicability and superiority of the telephone over the telegraph in the handling of trains.

The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Articles of Incorporation in North Dakota

To organize a corporation in Dakota, does it require the same articles of incorporation as for an ordinary company? We have the ordinary form, but do not know whether it is sufficient.

Article of telephone companies must include, besides the ordinary requirements, the place to and from which the line is to run, and its branches, the counties through which it is to be constructed and the estimated length and cost of the line. Therefore the ordinary form is not sufficient. By writing to the Secretary of State you will undoubtedly be able to secure the exact form required.

Revised Code of 1905, Sec. 4174.

Ordinance Not for Public Benefit But Granting Special Favor Invalid

At Louisville, Ky., the ordinance requiring the sale of a telephone franchise to be made at public auction has been held invalid by Judge Gordon. The suit had been brought by the Home Telephone Company and John Coleman, president of the company, suing as taxpayers against the Board of Public Works and the city to compel the sale of the franchise. The Board of Public Works had refused to sell the franchise on the theory that the ordinance creating it was invalid. A mandatory injunction had been sought to require the sale.

Judge Gordon held in the first place that the plaintiffs could not sue as taxpayers, that their status as taxpayers was merged into their special interest in the ordinance. In the next place he found that if the ordinance were legally enacted, the plaintiffs had never acquired under its terms any right to sue in their capacities of special interest. They had not done so for the reason that it was not certain that they would be successful bidders for the franchise, or, being such, that their bid would be approved by the General Council.

It was next found that the ordinance had been passed for the plaintiff's special benefit, whereas, to be legal, it should have been passed for the benefit of the public. He ruled furthermore that the intervening petition of Victor H. Engelhard & Company and other taxpayers which had been tendered might be filed. Said the Court:

"The usual provision in city charters that contracts for public work shall be awarded to the lowest reliable and responsible bidders was not enacted to furnish employment for contractors, or to benefit a bidder for such work, but with the design to benefit and protect the property holders and taxpayers of the municipality."

City May Not Impose Additional Burdens on Company

When a city, by its ordinance granting a franchise to a telephone company, has invited investments and expenditures, which are made in good faith and in reliance upon it, the city authorities, if the use be a public one, cannot arbitrarily impose, by subsequent regulations, without necessity or the demands of public convenience, additional burdens upon the company, which are clearly beyond the reasonable exercise of the police power, so the supreme court of Nebraska held in a case brought by the City of Plattsmouth for a mandatory injunction against the Nebraska Telephone Company. The city alleged that it had

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never granted the company any lawful franchise, and that the company had been occupying the streets for more than fifteen years without authority. The city further alleged that certain poles and wires of the company were injurious to pedestrians and property and constituted a nuisance; that the city had required the company to place its wires underground, but that the company had refused to do so. On the part of the company, it was contended that the city had passed an ordinance in 1898, giving the company the right to occupy all the streets of the city without restriction, reserving to itself the free use of the company's poles for its own fire alarm wires; that immediately after the passage of the ordinance, the company had expended large sums of money in reconstructing its poles and wires, and that the latter were sound and in good condition, not at all dangerous nor amounting to a nuisance. The company alleged the ordinance requiring the placing of its wires underground to be unreasonable and a violation of the contract between the city and the company. On the hearing of the case it appeared that the city had actually adopted an ordinance giving the company permission to construct its line in the streets, but the city contended that this ordinance was invalid, because it was an attempt to give the company a special privilege or franchise, and that this was beyond the power of the municipal authorities, because violating section 15 of Article 3 of the constitution of Nebraska, which prohibits the Legslature from passing special laws granting to any corporation any special or exclusive privilege or franchise. The court held that the city ordinance did not attempt to grant an exclusive right or privilege, because none of its provisions indicated any attempt to exclude other like corporations or companies from a like privilege. The court, therefore, held that the city had authority to grant the franchise, and could not subsequently repeal. The court further found that the poles in the streets were not a nuisance, and on all these grounds denied the injunction asked by the city.

City of Plattsmouth vs. Nebraska Tel. Co., 114 N. W., 588.

Practical Questions and Answers*

Splitting Cable Pairs (1041)*

On a certain lead we run a 50-pair cable to give metallic circuits from the central office to the box. From the box we use a common return, No. 8 copper wire, clear from ground. Would it be just as well to split the pairs in the cable, and then run lines common return, instead of metallic, as now?

By all means keep to your present plan. If you split pairs your cross-talk will be worse and your service poorer. If later you should need to make any line metallic all the way to the substation you can easily do it if you stick to your present scheme. But if you split pairs and your cable gets full, as cables do, you cannot meet the demand for improved service.

Preventing Cross Talk Between Farmers' Lines (1042)

I would thank you very much for a transposition layout which would remedy cross-talk between two of our grounded farmers' lines, built as shown in my sketch (Fig. 1042*a*).

The main line is of No. 10 B.B. galvanized iron wire. It is 23 miles long, with eight switching stations connecting. The farmers' line is 1¼ miles long, of No. 10 B.B. galvanized iron wire, strung on about 40 poles.

Both lines are on the same pole lead, supported on brackets. Brackets for the respective lines are nailed to opposite sides of the poles, and the wires are about 14 inches apart.

The cross-talk between the two circuits is at all times very distinct and annoying.

If you have two parallel lines on the same poles, and both

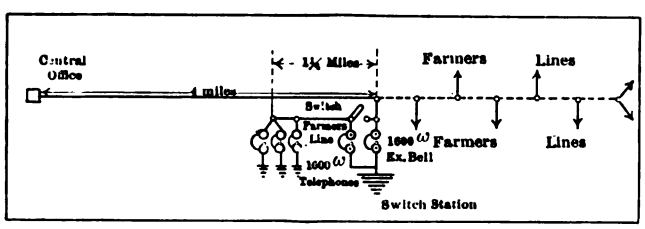

Fig. 1042a.

are single wire, ground return circuits, no transposition is possible. Transposition consists in alternately shifting the two wires forming a metallic circuit from one side to the other—that is, of interchanging their positions at equal intervals—throughout the exposed section. This device offers both wires equally to the inductive influence of the disturbing circuit, and the equal effects produced in each wire of the metallic pair give rise to a condition of neutrality which prevents noise in bridged telephones. The idea is simply illustrated in Fig. 1042*b*.

If one circuit is grounded and the other metallic, you can see that the metallic circuit may be transposed against the grounded. This also, incidentally, prevents cross talk in the other direction, from the metallic to the grounded circuit.

In your case, as no transposition is possible for two lines unless at least one of them is a metallic circuit, having the two

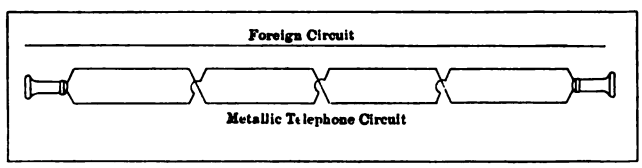

Fig. 1042b.

wires of the same size and character, the best thing you can do is to make one of your lines metallic. The only way to prevent cross talk between two single wire, ground return lines is to separate them by a considerable distance, say 8 or 10 feet.

In order to care for the cross talk between the two sections of your farmers' line we would recommend making the "main" line circuit metallic, at least throughout the section where it is paralleled by the branch line.

In Fig. 1042*c* is shown a suitable transposition arrangement. A common method of throwing in transpositions is shown in Fig. 1042*d*. It makes no difference whether the left-hand or the right-hand wire goes over or under the other.

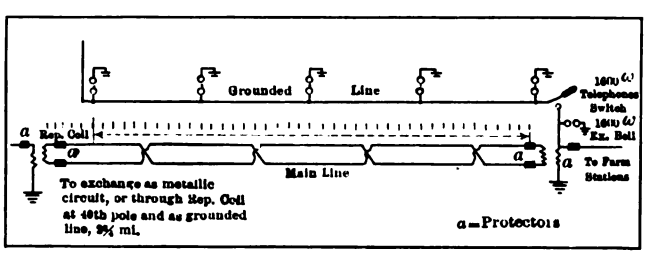

Fig. 1042c.

If there are no stations or drops on either the main line or the branch line in the 1¼-mile stretch over which they are parallel, the suggested transposition scheme will be suitable as laid out.

If, however, there are stations on the branch line with drops taken off along the lead of the main line, it is evident that the section of the main line between each two stations of the branch line must be transposed individually. This may be accomplished probably with complete satisfaction by measuring half the distance between each two stations or drops and cutting in a transposition at this point. This is to be done instead of using the regular arrangement shown.

*Replies to queries designated by an asterisk (*) are furnished by Arthur Bessey Smith, Asst. Prof. Telephone Eng'g, Purdue University.

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It is advisable, although not absolutely necessary, to make the entire 4 miles from the exchange to the switching station metallic. This obviates the necessity for a second repeating coil on a pole 2¾ miles from the exchange. This will minimize the reduction of transmission and ringing efficiency, and will

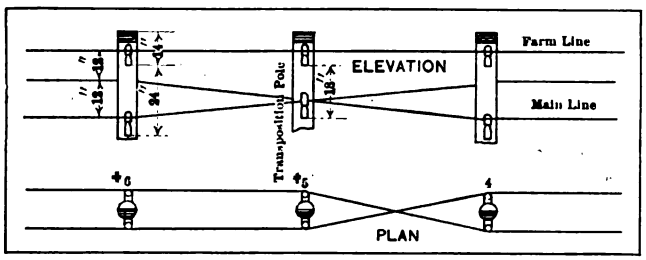

Fig. 1042d.

save a considerable expense for maintenance of the second coil. The main line should, therefore, be brought all the way to the exchange metallic.

The repeating coil at the switching station should be placed inside where it will be protected by the lightning arresters. The main line is therefore brought in metallic and then carried out again as a grounded line.

In order to mimimize the reduction of ringing efficiency from the distant stations to the exchange the switching station coil should be placed on the grounded side of the repeating coil. You should use a coil of the type described by the manufacturers as a "talk and ring-through" coil.

Testing Insulation of Telephone Lines (1043) *

In making an insulation test on a toll line will you kindly tell me which polarity of the test battery is connected to earth and which to line? I understand that it is the practice of some telephone companies to take two readings—one with the negative terminal of the battery connected to earth, and one with the positive terminal connected to earth, the final result being obtained by taking an average of these two readings. I would like to know if there is any reason why these two readings should be different, and if so, what is it?

Would you also tell me what is considered good insulation resistance in megohms per circuit-mile?

In practically all cases there exists some difference of potential between any two ground connections. It is due to differences in the nature of the soil, its temperature and the materials of which the two ground plates or rods are made. It produces a battery of small voltage. If there are trolley lines near, the leakage of direct current through the soil will produce differences of potential greatly in excess of those above mentioned.

When you measure the insulation, you put battery, galvanometer (or voltmeter) and the leakage of the line in series. If there is no voltage beside the battery, the current flowing will be.

$$I_o = \frac{E}{R}$$

where E is the battery voltage and R the resistance of the insulation. But if there is a small voltage, e, due to the earth conditions, the first measurement will give us $I_1 = \frac{E + e}{R}$, assuming that the earth voltage aids the battery.

Reversing the connections we get $I_2 = \frac{E - e}{R}$

Adding the two currents and dividing by two,

$$\frac{I_1 I_2}{2} = \frac{E + e + E - e}{2R} = \frac{E}{R}$$

A toll line should not fall below one megohm per mile. If it does, it should receive prompt attention. Keep it up to several megohms, four or five if possible. In some parts of the country this is easy to do, and in others difficult.

TO WIRE CHIEFS AND MAINTENANCE MEN

Clearing of troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men. These the AMERICAN TELEPHONE JOURNAL *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

Telephone Finances

Cumberland Financial Report

The report of the Cumberland Telephone & Telegraph Company for the month of June and six months ended June 30, compares with preceding years as follows:

	1908.	1907.	1906.
June, gross	$504,364	$482,499	$451,294
Expenses	292,209	298,184	288,498
June, net	$212,155	$184,315	$162,796
Charges and taxes	35,374	38,026	32,287
June, surplus	$176,781	$146,289	$130,509
Six months, gross	$3,056,978	$2,886,952	$2,635,736
Expenses	1,782,208	1,781,914	1,649,094
Six months, net	$1,274,770	$1,105,038	$986,642
Charges and taxes	233,010	239,843	176,005
Six months, surplus	$1,051,760	$865,195	$810,637

Earnings of Bell Operating Companies

The recently published statement of the American Telephone & Telegraph Company, reporting the earnings of all the Bell operating companies, except the long distance lines, shows $11,578,000 available for dividends in the first five months of 1908, an increase of $790,700 over the amount so available in the corresponding period last year. The figures showing the earnings of these companies for May and for five months are as follows:

	May, 1908.	Five months 1908.	Increase over five months 1907.
Telephone revenue	$9,890,300	$48,814,700	$3,009,300
General operating and maintenance expenses	7,266,900	36,038,400	1,974,700
Balance from operation	$2,623,400	$12,776,300	$1,034,600
Sundry earnings (net)	421,600	2,057,600	185,600
Total net earnings	$3,045,000	$14,833,900	$1,220,200
Interest charges	640,500	3,255,900	429,500
Available for dividends	$2,404,500	$11,578,000	$790,700
The maintenance and taxes items (included above) are:			
Maintenance	$2,801,600	$13,951,400	$1,367,800
Taxes	416,300	2,068,500	213,800
Total	$3,217,900	$16,019,900	$1,581,600

Meeting of a Pennsylvania Company

The sixth annual meeting of the stockholders of the Union Telephone Company, California, Pa., followed the payment of the twelfth semi-annual dividend. Since the organization of the company the semi-annual dividends have averaged 3½ per cent, while the company has also added considerably to its

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plant out of its earnings. It is reported that the number of subscribers has grown from 272 to 368 during the past year. The following statement was mailed with the dividend checks and published in a local paper subsequent to the annual meeting:

Statement for Six Months Ending June 30, 1908.

Cash balance January 1, 1908	$212.67
Toll receipts for six months	202.50
Rental receipts for six months	2,112.15
Other sources	49.75
	$2,577.07
Dividend June 30, 1908	$700.00
Expenses six months	16.72
Maintenance six months, material and labor	1,201.28
Office fixtures added six months	28.97
Office labor and supplies six months	363.24
Cash in treasurer's hands June 30, 1908	266.86
	$2,577.07
Fixtures	$1,085.69
Less depreciation	100.00
	$985.69
Cash	266.86
Due from other telephone companies	267.04
Net gain to date, June 30, 1908	$1,519.59

This company, incorporated in 1903, has a magneto system, 300-line switchboard, with copper metallic circuits. The capital is $20,000, all paid in.

The officers of the company are: W. C. Smith, president; T. J. Underwood, vice-president; R. B. Drum, second vice-president; W. J. Weaver, secretary-treasurer; H. L. Lamb, manager.

Good Prospects for Independent Telephone Financing in Pennsylvania

Robert W. Dunlop, general manager of the Telephone Securities Company, of Harrisburg, Pa., says that the financial outlook is brighter than it has been for some months. Mr. Dunlop's business is disposing of telephone stocks and bonds (principally bonds), and he is in a position to judge how investors view the situation. He said a few days ago to the Harrisburg correspondent of the AMERICAN TELEPHONE JOURNAL that the outlook undoubtedly is brighter than it has been for months, and he added that the coming three years will be the best period for sound investments that the country has ever known.

Toledo Home Finances

A recently published abstract from the report of the Toledo Home Telephone Company for the year ending Dec. 31, 1907, shows the following:

	1907.	1906.	Changes.
Gross	$354,618	$315,288	Inc. $39,330
Expenses	157,200	134,916	Inc. 22,284
Net	$197,418	$180,372	Inc. $17,046
Charges	68,327	66,314	Inc. 2,013
Surplus	$129,091	$114,058	Inc. $15,033
Number of telephones	12,584	10,331	Inc. 2,253

This company, which has been in operation since August, 1902, now has in service approximately 12,800 telephones.

Telephone News

No Consolidation at Indianapolis

The Central Union Telephone Company has rejected the proposal made by the Indianapolis Telephone Company and the New Telephone Company, through the Board of Public Works, for a consolidation of the properties of the three companies.

The principal reason assigned by President Richardson in his letter of refusal was the manner of selecting appraisers. He objected to the city reserving the right to select the third appraiser, each of the companies choosing one. He charges the companies with lack of good faith and says their proposal for unification, containing terms different from those in the agreement submitted by his company, was only to throw dust in the eyes of the public while securing the new franchise which has recently been recommended by the Board of Public Works.

Concerning Sensational Rumors of Independent Combination

Reports from Cleveland and elsewhere have in the past few days been circulated throughout the country stating that plans for a merger of Independent lines are under way. Some of these reports announce that the completion of the deal will occur at a conference to be held at Niagara Falls in August.

At Cleveland it was stated by a man who stands high in the Independent telephone business that the meeting to be held at Niagara Falls on Aug. 15 is simply an adjourned session of the meeting held at Detroit two weeks ago. He says the subjects to be discussed will pertain to the standardization of accounts and equipment, a matter that the companies are trying to work out along the same lines that the electric railways are pursuing in their association work. Along with these subjects will perhaps be discussed the facilities for improving the long distance service, and no doubt the activities of the competing companies in different sections of the country will receive some attention, though no action is anticipated.

The reports printed in some of the daily papers regarding the merging of the long distance companies are characterized as "hot air," and the telephone men say that it would be silly to think of taking such a step at this time. The words of one man at the Detroit meeting perhaps led the newspapers to guessing along these lines.

The old plan of working in unison is still being carried out, and that is as far as anything like a merger has gotten yet. What the future may bring with it, especially on the return of normal financial conditions, can only be conjectured. A close working arrangement of the long distance companies would suggest itself as the logical conclusion to one considering the situation at present, but further than this it is asserted that there will be nothing done.

New Business Reported by American Union Company of Pennsylvania

Notwithstanding the industrial and financial depression which has dulled business throughout the country generally, the Independent telephone business in central Pennsylvania has suffered little. The work of extending the business of the American Union Telephone Company, of Harrisburg, was kept up steadily throughout the fall, winter and spring. A recent announcement by M. E. Robb, the superintendent of contracts for the American Union, shows a gratifying number of new rural companies connected with its system during the 60 days ending July 15, as well as a number of private branch exchanges and intercommunicating systems installed in the offices of subscribers who awoke to a realization of the fact that their existing equipment was inadequate to the demands of their business.

Following is a complete list of the new rural companies as furnished by Mr. Robb:

Upper Allen Telephone Company and Balfour Telephone Company, both connecting with the exchange at Carlisle; Friedensburg Rural Telephone Company and McKeansburg Rural Telephone Company, both connecting with the American Union exchange at Pottsville; North Annville Telephone Com-

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pany, connecting with the Lebanon exchange; Mt. Rock Telephone Company and Woodstock Telephone Company, both connecting with the Chambersburg exchange; Krumrine Station Rural Telephone Company and Gatesburg Road Rural Telephone Company, both connecting at State College; Lost Creek Valley Rural Telephone Company and Ferguson Valley Rural Telephone Company, both connecting at Mifflintown; Sylvan Dell Telephone Company, connecting at Williamsport.

Private branch exchanges installed within the past two months are as follows:

Metropolitan Hotel, Harrisburg (already noted in the columns of the AMERICAN TELEPHONE JOURNAL); Windsor Hotel, Shamokin; Susquehanna & New York Railroad Company office, Williamsport; Kennedy Valve Company office, Elmira, N. Y.; Phoenix Iron Company office, Phoenixville.

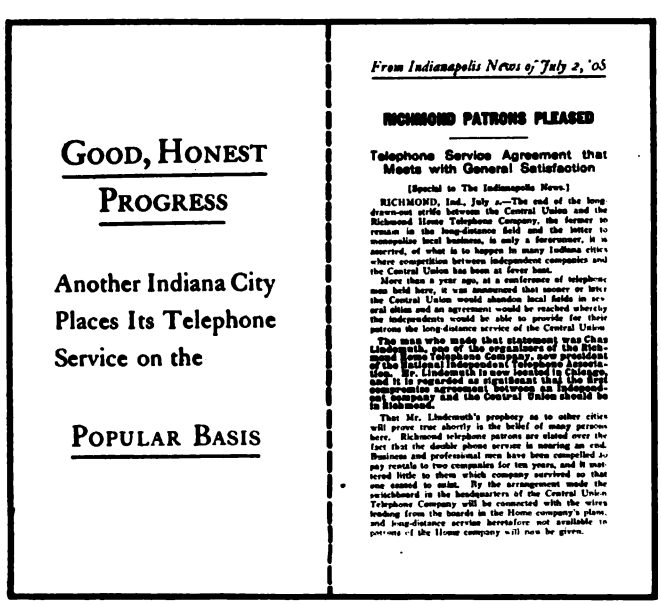
Intercommunicating systems have been established during the same period in the offices of the Cumberland Publishing Company, Harrisburg, and the Grater Bodey Company, Norristown.

The Richmond Joint Operation Contract

Wide newspaper publicity has been given in the past few days to various matters in connection with the joint operation contract recently entered into between the Richmond Home Telephone Company, of Richmond, Ind., and the Central Union Telephone Company.

Although of itself this contract would have been of no particular importance, the Independent telephone business at Richmond being practically no different from that in many other cities of similar size, where the local business of its competitor is small as compared to the extent of its toll facilities, the fact that Mr. A. C. Lindemuth was president of both the Home Telephone Company and the International Independent Telephone Association was in some quarters seized upon as a pretext for ascribing special significance to this agreement.

As a matter of fact, the principal effects of the conclusion of this agreement have been to cause Mr. Lindemuth some per-



GOOD, HONEST PROGRESS

Another Indiana City Places Its Telephone Service on the

POPULAR BASIS

From Indianapolis News of July 2, '05

RICHMOND PATRONS PLEASED

Telephone Service Agreement that Meets with General Satisfaction

[Special to The Indianapolis News.]

RICHMOND, Ind., July 2.—The end of the long, drawn-out strife between the Central Union and the Richmond Home Telephone Company, the former to remain in the long-distance field and the latter to monopolize local business, is only a forerunner, it is asserted, of what is to happen in many Indiana cities where competition between independent companies and the Central Union has been at fever heat.

More than a year ago, a conference of telephone men was held here, it was announced that sooner or later the Central Union would abandon local fields in several cities and an agreement would be reached whereby the Independents would be able to provide for their patrons the long-distance service of the Central Union.

The man who made that statement was Chas Lindemuth, one of the organizers of the Richmond Home Telephone Company, now president of the National Independent Telephone Association. Mr. Lindemuth is now located in Chicago, and it is regarded as significant that the first compromise agreement between an Independent company and the Central Union should be in Richmond.

That Mr. Lindemuth's prophesy as to other cities will prove true shortly is the belief of many persons here. Richmond telephone patrons are elated over the fact that the double phone service is nearing an end. Business and professional men have been compelled to pay rentals to two companies for ten years, and it mattered little to them which company survived so that one ceased to exist. By the arrangement made the switchboard in the headquarters of the Central Union Telephone Company will be connected with the wires leading from the boards in the Home company's plant, and long-distance service heretofore not available to patrons of the Home company will now be given.

Circular Said to Misrepresent Views of Mr. A. C. Lindemuth.

sonal embarrassment, and to stimulate greater activity in the investigation of methods of invoking the law to prevent consolidation between competing telephone companies. To the subject of the prevention of such consolidation it is well known that Mr. Lindemuth has given his most careful and vigorous attention.

Mr. Lindemuth's position with respect to the negotiations carried on at Richmond is clearly indicated by an abstract from a letter written by the secretary of the Richmond Home Telephone Company, dated July 17, in which he says, "I am authorized by the directors of the Richmond Home Telephone Company to say that they regret that your position as president of the Independent Telephone Association made it necessary for them to conduct the negotiations and consummate the contract recently made with the Central Union Telephone Company without your knowledge or consent."

With respect to a certain example of "publicity matter" of the type intended to give the impression that special significance attaches to this Richmond contract, the following letter received from Mr. Lindemuth is of interest:

"I want to say that the statement attributed to me in the attached circular purporting to be a copy of a special dispatch to the Indianapolis *News* from Richmond, Ind., of date July 2, is absolutely untrue. At the time the statement is alleged to have been made I was president of the Indiana Independent Telephone Association and it is not at all likely that I would have made such a statement as that at a public telephone meeting. Besides I did not believe the fact or prediction contained in the statement at that time nor do I believe it now.

"I have been informed and believe that the Central Union Company was ready and willing to abandon the local exchange field in Indiana to the Independents upon an equitable basis. This fact, however, was generally known to every Independent telephone man in the State of Indiana; was mentioned in the executive committee meetings, at district meetings and on the floor of the state convention. In fact, a proposition along these lines was presented in writing by representatives of the Central Union company to the joint meeting of the first, second and third districts of Indiana, and carried up and presented by the executive committee at the state convention, but being unsigned by the official heads of the Central Union and the A. T. &. T. Co., the committee refused to consider the proposition. This matter was fully discussed on the floor of the convention, and a resolution presented by the executive committee, of which I was chairman, covering the entire history of the matter, was adopted by the state convention and published in the Indiana bulletin at the time.

"The positive statement contained in the circular that 'sooner or later the Central Union would abandon the local field in several cities and an agreement would be reached whereby the Independents would be able to provide for their patrons the long distance service of the Central Union' was not made by me, nor did I hear any other person make such a statement at the telephone meeting."

Portland Councilmen Would Have Police Use Axe on Telephones

A new version of the extent of a city's police power is suggested in the following extracts from a newspaper report of what must have been an exciting meeting of the City Council held at Portland, Ore., on July 8:

"The City Council unanimously voted to instruct City Attorney Kavanaugh to furnish at once an opinion as to whether the Council is empowered, under the terms of the franchise of the Pacific Telephone & Telegraph Company, to revoke the grant unless a greatly-improved service is maintained by that corporation. * * * Councilmen Kellaher and Driscoll fought for an amendment instructing Chief of Police Gritzmacher to go out with axes and tear down all the slot-machine telephone boxes now in service throughout the city. However, it was thought best to reserve this action, if taken at all, until after the report is received from the city attorney on the power of the Council."

Telephone Taxation at Hattiesburg.

City officials at Hattiesburg, Miss., are somewhat aroused by what they consider to be an attempt to evade taxation on the part of the Cumberland Telephone & Telegraph Company. The Cumberland company is understood to have 632 telephones in Hattiesburg, and the Home company has in the neighborhood of 650; yet when the returns for taxation were called for the

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Cumberland company gave its plant valuation as $10,000, while the Home company set the value of its plant at $20,800. The assessors are unable to account for such a discrepancy and in consequence have set the value of the Cumberland at $28,900. The result is that the question of fair dealing with the city by the respective companies has been prominently raised, and considerable sentiment in favor of the Home company aroused.

Central Union Company Shown to Be Behind Indianapolis Independent Franchise Injunction

The telephone situation in Indianapolis was clarified on the hearing before Judge Allen, of the Circuit Court, of an application brought by A. R. Hooton, county prosecuting attorney, for a restraining order and preliminary injunction against the New and Indianapolis Telephone Companies to prevent them from entering into a new franchise contract with the city. The defendant companies asked for a change of venue on the ground that it was impossible to have a fair trial in Marion County.

Prosecutor Hooton was surrounded by a remarkably interesting group of associate attorneys entered for this case only, and their right to appear was challenged under the charge that they were the attorneys of the Bell telephone company "butting into" the case in order to destroy the competing company in the name of the State and for the alleged protection of the people.

Judge Allen ruled that they would have to disclose the name of their employer, since Prosecutor Hooton had twice told the court that he had not employed them. After a heated argument and an acknowledgment upon the part of the prosecutor that the attorneys in question were reputed to be in the employ of the Bell company and that all the papers in the complaint, notices, etc., had been prepared in the case by the attorneys reputed to be in the employ of the Bell company, he requested the court to allow them to remain in the case to render him such assistance as possible for them to do. Upon Prosecutor Hooton's agreement to appoint them as his assistants and be responsible for their acts they were permitted by Judge Allen to remain in the case.

Thereupon Judge Allen refused to grant the injunction and sent the case to Hendricks County for trial.

Florida Keys to Be Connected by Telephone

New lines are being built to bring the Florida "Keys" into touch with the peninsula, and it is stated that by next winter many of the "Keys" will be completely equipped for communication. The Western Union Telegraph Company is also extending its lines in this section, doing work which is stated to be among the finest examples of aerial construction in the South. Every pole is planted in solid rock, and is extra storm-guyed to withstand the winds to which the line will be subjected from the Atlantic Ocean on one side, and the Gulf of Mexico on the other. It is reported that these poles will also carry telephone wires.

With the completion of the Florida East Coast Railway into Key West, it is announced that both the Western Union and Southern Bell telephone wires will enter that city along the line of the railway, thus giving to our southernmost city telephone communication with the mainland for the first time in its history.

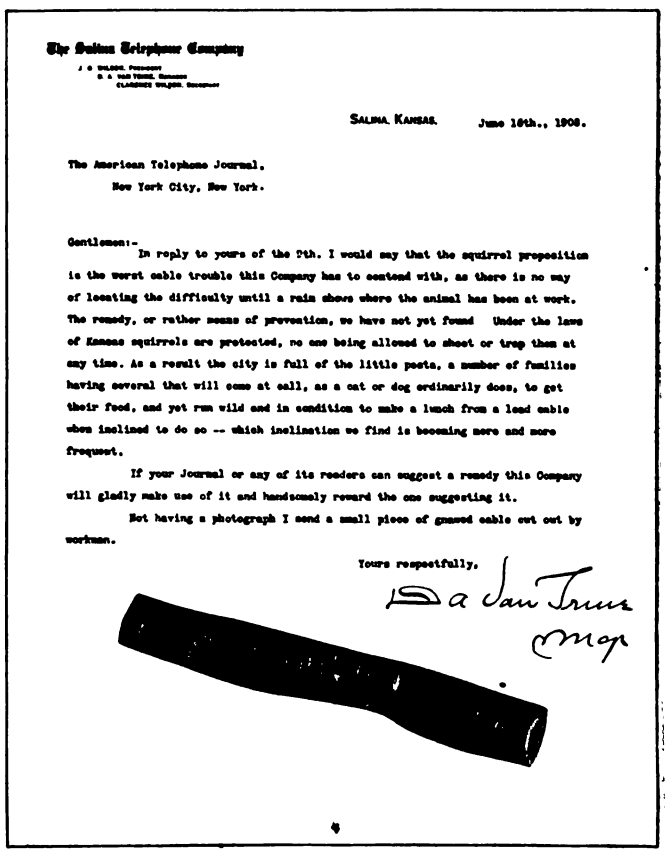
Metropolitan Home Telephone Company's Plans Progressing in Boston

It is understood that the Metropolitan Home Telephone Company, of Boston, which received a franchise in December, 1906, is finally taking steps toward the beginning of construction of an Independent system. Under the terms of its franchise the company must begin construction before Jan. 1, 1909, and have in operation before Jan. 1, 1910, a telephone system adequate for the service of 20,000 subscribers. In the event of the company's failing to have its system in operation with 20,000 subscribers or ceasing operations entirely before July, 1910, it must pay to the city of Boston $100,000 or forfeit its charter.

In consideration of the franchise the company will furnish the city with free telephones in the ratio of one telephone to each 2000 population of the city, additional telephones to be paid for by the city at a discount of 33 1/3 per cent from the company's regular rates. The franchise also provides that the company shall never directly or indirectly sell, assign, convey or lease its plant to nor combine or merge with the New England Telephone & Telegraph Company, the American Telephone & Telegraph Company nor those under them, under the penalty of the forfeiture of all its rights and all the property then installed to the city. Combinations with other companies as to Boston rates are prohibited, but the company may make contracts or agreements with telephone systems or exchanges outside of Boston for interchange of business and division of earnings from their connecting lines. A $50,000 bond is now being procured by the company's counsel for filing with the city clerk according to the provisions of the franchise.

Trouble Caused by Squirrels in Kansas

The following letter has been received from the manager of the Salina Telephone Company, Salina, Kan. It is quite evident that the telephone companies of Kansas are up against a new



The Salina Telephone Company

SALINA, KANSAS, June 16th., 1908.

The American Telephone Journal,
New York City, New York.

Gentlemen:-

In reply to yours of the 9th. I would say that the squirrel proposition is the worst cable trouble this Company has to contend with, as there is no way of locating the difficulty until a rain shows where the animal has been at work. The remedy, or rather means of prevention, we have not yet found. Under the laws of Kansas squirrels are protected, no one being allowed to shoot or trap them at any time. As a result the city is full of the little pests, a number of families having several that will come at call, as a cat or dog ordinarily does, to get their food, and yet run wild and in condition to make a lunch from a lead cable when inclined to do so -- which inclination we find is becoming more and more frequent.

If your Journal or any of its readers can suggest a remedy this Company will gladly make use of it and handsomely reward the one suggesting it.

Not having a photograph I send a small piece of gnawed cable cut out by workman.

Yours respectfully,

Evidence of Damage Done by Squirrels.

and troublesome proposition and one which is out of the ordinary line of trouble encountered in telephone work. We shall be glad to hear from readers who have suggestions to offer.

Mercer County, Ill., Using Independent Telephone

At their regular June meeting, held at Alledo, the Board of Supervisors of Mercer County, Ill., ordered telephones for every office in the county court house. The contract was made with the People's Telephone Company, which will also maintain a free telephone in the court house for the use of citizens and taxpayers of the county.

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Ordinance Requiring Sale of Franchise Alleged to Be for Benefit of Company

At Louisville, Ky., the new telephone ordinance, which has been the subject of litigation for some time, was threatened from an unexpected source when A. Engelhard & Sons Company, the Bray Clothing Company, N. M. Cri, Charles W. Milliken and R. A. McDowell, suing as taxpapers and citizens, filed an intervening petition in the action brought by the Home Telephone Company to compel the Board of Public Works by mandamus to put up for sale the franchise in question. Fraud and collusion are among the charges made by the intervening petitioners against members of the General Council who favored the ordinance creating the franchise and agents of the company.

The petitioners say that when the Home Telephone Company purchased its franchise, created Nov. 5, 1900, they as taxpayers and citizens, acquired vested rights which it is now sought to abrogate by the action of the General Council. It is alleged that the fact of John Coleman's joining in the petition of the company was collusive because it made it possible for the company to maintain the action by reason of his large holdings of stock.

The intervening petitioners allege that the ordinance conflicts with the constitution because it restricts competition in the bidding on the franchise and is meant especially for the Home Telephone Company. It is said that at present the service is efficient and the rates reasonable, but that if the franchise were sold to the Home company competition would be destroyed and rates advanced. It is alleged that the ordinance creating the franchise is defective because it refers to more than one subject. It is further charged that there is no restriction imposed upon the holder of the proposed franchise not to enter unto an understanding with the opposing telephone company which would destroy competition.

Views of the Mayor of Indianapolis on Telephone Competition

Mayor Bookwalter, of Indianapolis, has been widely quoted, in connection with arguments both for and against telephone competition, therefore his address of welcome to the convention of Independent telephone men held at Indianapolis a few weeks ago is of special interest. We give his remarks practically in full, as follows:

We have been laboring with the telephone proposition in Indianapolis, and when I was compelled to take a position on one side or the other, it occurred to me that even my little boy could decide in the right. I believe that it is to the best interests of the people of Indianapolis that we should maintain intimate talking relation with the most telephone users. When I found that there are a hundred and forty-five or fifty thousand users of Independent telephones in Indiana as compared with Bell and licensed companies to the number of thirty thousand, it occurred to me that it was more beneficial to the people of Indianapolis to maintain close relations with the hundred and fifty thousand than it was with the thirty thousand. Early in the telephone situation in Indianapolis I was in favor of two propositions: First, the maintenance of competition; and, second, by some legal method, to compel every telephone company, Independent and Bell alike, to interchange messages with every other telephone company. There is no reason why, if I have a Bell telephone in my house, and my father has the New telephone in his home, it would be necessary for me to maintain two telephones in my home to get into touch with him over the wire. If I elected to use the Bell and he the New, I should have the right in Indianapolis to call him first through the Bell exchange into the New switchboard and communicate with him, if I am willing to pay the toll. I took up the proposition on the theory that we wanted competition. I am not in favor of Indianapolis becoming as is Cincinnati; I am not in favor of Indianapolis becoming situated as is New Orleans, as I see by this paper they pay $126 a year for their telephones because of the fact that they have no competition. I am in favor of maintaining a check upon the Independent companies by fair and proper treatment of the Bell, and I am in favor of maintaining a check upon the Bell by fair treatment of the Independents. But we have in our community some people who think differently upon this question. It is human nature to look upon every proposition from the standpoint of what is best for the pocket, so when a committee representing users of both telephones broached the proposition of a solution of the telephone question they naturally said that two telephones were a nuisance because they had to pay for two telephones. But they failed to say that they constituted only 15 per cent of the users, and that to 85 per cent of the users, two telephones were no more of a nuisance than one, because they only pay for one anyhow. So I say that it is to the interest of all the people, even these gentlemen that submit these reports, that we should have more than one telephone; that there should be maintained competition, because competition has brought down the price. And when it brought down the price it brought down the price to 85 per cent of the users and only adversely affected the 15 per cent who have the dual service.

The average man, when he determines to put in a telephone, takes the one offered him by the company that furnishes him the convenience to call all those people with whom he most wishes to talk. When you put the one in, if they don't treat you right you can always have the right to take the other telephone, and this keeps both of them on their good behavior.

The consumer is interested in having competition. In my investigation of this question I came early to believe that competition was the thing that the people of the city of Indianapolis wanted because we needed it to keep both companies on their good behavior. We may some time have consolidation, but the people do not consider it to their interest to do this thing. Consolidation is a good thing for the company, but it would not be good for the people of Indianapolis.

San Francisco Telephone Rates Reduced

It is understood that the Pacific Telephone & Telegraph Company is making the reductions provided for in the new telephone ordinance in San Francisco. The rate for residence telephones with unlimited service has been reduced from $5 to $4 per month for private lines and from $4 to $3.50 per month for two party lines.

North Dakota Independent Company at Fargo

The North Dakota Independent Telephone Company is increasing its office in Fargo, N. D., making that city its headquarters. The auditor's office will be moved from Minneapolis the last of this month, but the president's office will remain in Minneapolis.

Book Review.

THE THEORY, DESIGN AND CONSTRUCTION OF INDUCTION COILS. By H. Armagnat, translated and edited by Otis Allen Kenyon. McGraw Publishing Company. 216 pages, illustrated. Price, $2.

This book deals, not with the simple telephone induction coil, but with the type in which periodic interruptions of the primary circuit serves to produce, in the secondary, currents or disruptive discharges adapted to facilitate various commercial and laboratory processes. The history of this type of coil is related. Theoretical discussions, employing as much as is necessary of mathematics, cover the working of the several types of interrupters, conditions resulting from variation of primary and secondary design, and other points in connection with the construction of coils. An ample chapter describes the uses of coils of this type. The book is particularly useful to experimenters in wireless transmission, as well as to the general student of the subject of its title.

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New Features of Milwaukee Directory

In its latest directory for the city of Milwaukee the Wisconsin Telephone Company has introduced several new features of interest. Among these may be found the printing of certain classified general information, including train schedules for steam and electric roads, baseball schedules, general information tending to boom Milwaukee, a list of city officials, and of points of interest in the city. The reason for printing the train schedules is that the Milwaukee newspapers no longer carry them in their columns. Eight pages in the back of the book, printed on paper of special color, are devoted to this information.

Other features of interest in the book, most of which are understood to have been embodied in previous issues, are the insertion of two colored leaves in the front of the book containing a supplemental list of subscribers received too late for insertion alphabetically. Following this come two pages of information and suggestions to patrons, then a list of public telephone stations, followed by a list of exchanges and toll stations operated by the company. At the foot of the last pay station page is the following effective advertising copy: "If your name appears in the telephone direcory you can telephone to 750 grocery stores, 450 meat markets, 250 bakeries, and to every live merchant in Milwaukee. For convenience, have telephone service."

The regular alphabetically arranged subscribers' directory is printed upon white paper. At the head of each left hand page is the admonition "Report trouble to chief operator" while each right hand page is headed with advice "For subscribers not listed, call information operator." Branch exchange listings throughout the book are followed by the sentence "Private telephone system. When their operator answers, state name of person, or department desired."

Following the alphabetical list of subscribers is a classified list of business houses, containing names in regular or heavy type, and advertisements.

The post card enclosures which the company has sent out to subscribers with each of the last three issues of the directory are interesting. On one end of the perforated sheet is printed a request to subscribers to let the company know of any irregularity in service or forward any complaint which they may wish to make concerning the company's business methods or rules, while the other end is an addressed postal card. Thirty thousand copies of each issue of this card were distributed to Milwaukee subscribers in connection with each of the directory issues of Oct., 1907, Feb., 1908 and June, 1908.

Of the October issue, returns were received from 387; from the February issue, 345 replies were received. Up to the present time 134 replies have been received from the June issue.

Approximately 50 per cent of the replies cover complaints of irregularities in service, requests for telephones to be removed, requests for additional copies of the directory, and other miscellaneous items. Approximately 25 per cent made request for changes of the listing in the directory. The remaining 25 per cent made complimentary mention of the service.

The object of this card is to give the subscribers an easy path for reporting any irregularity in the service, no matter how small. At the same time the matter in the cards contains suggestions for the proper use of the telephone and the company feels that something has been accomplished in this direction, as well as in giving the subscriber an opportunity to file any complaint that he may have to make. That the card has produced good results is the general conclusion of the company.

California Association Meeting

A meeting of the California Independent Telephone Association was held at Whittier, Cal., Saturday, July 11.

The delegates gathered at the University of California Pathological Laboratory, where they were shown the methods used in fighting "blight" on the various trees throughout the State. From the laboratory they were driven to the new factory of the National Electric Company to inspect the new styles of switchboards, fire-alarm systems, incitophones, annunciators, etc. A representative of the Vita Manufacturing Company was present to explain the advantages of their dry battery.

At 5 p. m. the business session was held in the Greenleaf Hotel. Mr. F. A. Powell, of San Fernando, read a paper on "Standardizing Our Bookkeeping," and the members joined in an informal discussion of it. Treatment of employees was also taken up. After all business was disposed of a banquet was served and cares were thrown aside. Music was furnished by residents of Whittier and the delegates all joined in with stories, jokes, etc. In fact, the evening passed so quickly that few were ready to leave when train time rolled around. About 25 members were present.

The next meeting will be held in Long Beach, Cal.

Telephone Patents

TELEPHONE SWITCHING AND SIGNALING APPARATUS.

James G. Wray and Wm. G. Kinton, Chicago, Ill., and Herbert T. Gardner, Maywood, Ill., patent 893,414, July 14, 1908.

An arrangement of signal-controlling devices in the cord circuits used in connection with trunk lines between exchanges, is covered by this patent.

The ringing keys at the central offices are eliminated, the signaling and stopping of the signal being dependent upon the placing of the calling plug in the jack, and upon the removal of the receiver at the called subscriber's station.

By means of relays the supervisory signals are placed under control of the operator at the exchange where the call originates. An audible signal is given the calling operator and subscriber when the signaling current is sent out on the line.

The substations on a four-party line may be selectively signaled without interfering with the proper signaling on a selective two-party line or a single party line. The selective signaling on the four-party depends for its operation upon a relay, located in the trunk cord circuit, which acts as a pole changer in changing the direction of a pulsating current.

SELECTIVE SIGNALING SYSTEM.

Garrison Babcock, Chicago, Ill., patent 893,125, July 14, 1908.

This patent relates to selective signaling systems, improvements being made in the cord circuit of the system described in patent 763,351. Keys are provided so that the necessary current can be sent out on the lines from either plug or simultaneously through both plugs. Restoring keys and circuit changing keys are also provided for sending out a reverse current for restoring substation apparatus after a call has been made. Means are provided for connecting party lines of a system of one manufacture with metallic lines of a system of different manufacture, a plug fitting the spring jacks of one system being connected in bridge with the regular plug used in the cord circuit, permits subscribers on one system to call subscribers on another system.

TELEPHONY.

Isidor Kitsee, Philadelphia, Pa., patent 893,950, July 14, 1908.

This invention relates to trunk lines between telephone exchanges, the lines being closed at both ends through batteries connected in opposition to each other, so as to form a local

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talking circuit at either end when a plug is inserted in the jack. The signaling devices are connected at the terminals to show when the line is busy.

TELEPHONY.

Isidor Kitsee, Philadelphia, Pa., patent 893,249, July 14, 1908.

Means are provided by this invention to enable the operator to easily determine whether a trunk line is busy or not. The trunk lines are normally closed through the terminal jacks, and by means of a grounded circuit a lamp in a local circuit can be flashed by the operator when she wishes to talk to the operator in the other exchange. When a plug is inserted in the jack the grounded circuit is broken and the lamp is illuminated. The lamp remains lighted as long as a plug is inserted in either terminal jack. The operator can therefore tell the condition of a trunk line by taking note of the lamp associated with the line.

POLE.

Robert S. Orr, Pittsbrg, Pa., patent 892,880, July 7, 1908.

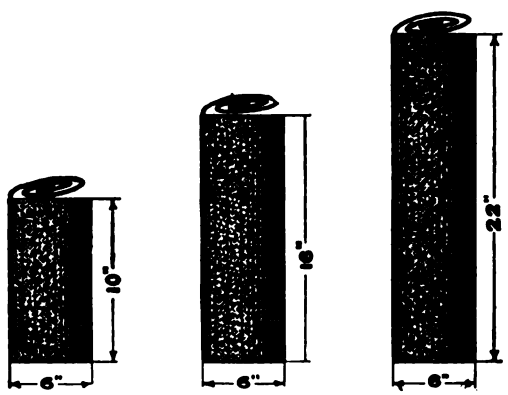
This invention relates to means for reinforcing old or decayed wooden poles with concrete or cement, held in place by metallic bars or rods.

In the Manufacturing Field

A New Ground Plate

The Federal cartridge ground plate makes an appeal for investigation to practical men who have wrestled with the problem of making satisfactory ground connections. By its use, its manufacturers claim that a practically perfect ground can be secured at a minimum of expense and trouble.

This device is gotten up in standard sizes with a specified area of plate and size of ground wire. The copper surface is completely covered with the proper grade of charcoal for securing the best ground. The whole is incased in a netting which holds the charcoal securely in place while being handled, but



Standard Sizes Cartridge Ground Plates.

breaks down when installed, allowing the earth to mix with the finely divided charcoal. The netting is meant to disintegrate rapidly as soon as the cartridge has been buried in moist earth. A heavy copper ground wire is firmly secured to the copper plate through its entire length, so that there is no chance for a break or loose connection.

The manufacturers suggest that a piece of fiber conduit be used to protect the wire from the ground plate to a point well above the surface of the ground. A rope drain fitted on the pole or wall will lead considerable rain water into this fiber conduit and so direct to the ground plate, insuring moist earth around the plate.

The Federal Electric Company, Lake and Desplaines Streets, Chicago, Ill., are the manufacturers of this device.

A Self-Cleaning Lightning Arrester

Every telephone exchange manager and practically every telephone user knows the danger of lightning. Lightning connot be prevented; all that can be done is to divert it and make it harmless.

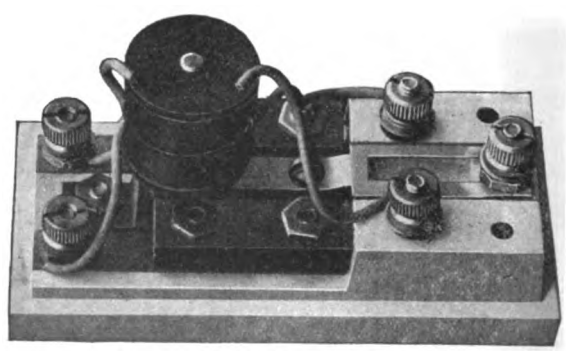
Accordingly, lightning arresters have been designed to prevent the lightning from getting into the telephone. There are hundreds of designs, but they all work on the same principle, viz., the lightning is induced to jump across a narrow air gap to a ground connection, over which it flows off harmlessly into the earth.

But in jumping across this narrow gap, which usually is only 5/1000 of an inch wide, the lightning is apt to break loose small particles of the carbon conducting plates, which particles fill up the gap and create a permanent ground. That is, while the lightning is diverted to the ground, there is a new trouble caused by the grounding of the line, so that the telephone is put out of service. Even where lightning does not come in upon the line, grounding often occurs by the accumulation of dust or dirt.

In order to work perfectly, a telephone must have its lightning arrester clean; that is, free from dust or dirt, and various kinds of so-called "self-cleaning" lightning arresters have been put upon the market. The American No. 600 Protector is a lightning arrester which is said to be absolutely self-cleaning.

It is made with two fixed carbon plates; one for each side of the line, with a third movable carbon plate between the other two. This movable carbon plate is held in place by a strip of spring metal, fastened at one end to the porcelain base. Being fastened at only one end, this spring moves freely up and down between the fixed carbons, and of course the middle carbon which is fastened to the spring moves up and down also. On each side of the middle carbon a thin strip of mica is fastened to prevent the middle carbon from touching the outside carbons.

On the top of the middle carbon a soft iron strip is fastened, and directly over this strip are mounted two small coils on a



The American No. 600 Lightning Arrester.

single core. These coils are made with each of the windings of very low resistance, less than one ohm to each coil. One coil is in series on each side of the line.

On a magneto system these coils are magnetized whenever a current is sent over the line, either to a telephone or from it, when the line is clear. The current from a generator being an alternating current, magnetizes and demagnetizes the cores of the coils and rattles the middle carbon with its soft iron strip up and down, shaking out any possible accumulations of dust or dirt and keeping the carbons always clean.

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Thus the American No. 600 Protector prevents grounding by dirt or dust, since every time the telephone is used, the ringing current from the subscriber's hand generator rattles the ground carbon and cleans the arrester thoroughly, preventing any possibility of grounding.

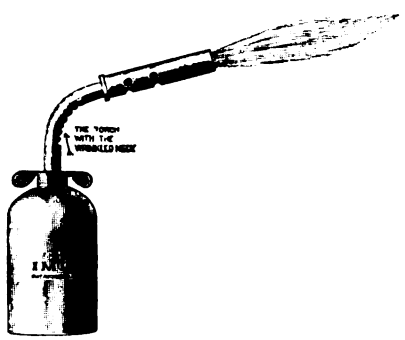
In a common battery system the grounding of the line at a telephone instrument would give a signal by lighting a lamp at the central office. As soon as this signal is noted at the central office, the wire chief may give orders to have a strong current sent out on that line. Such a current magnetizes the coils and vibrates the movable middle carbon of the arrester until the plates are cleaned. Thus, in a common battery system the arrester is cleaned from the central office, and in a magneto system it is cleaned by the subscriber himself.

This apparatus is made by the American Electric Fuse Company, Muskegon, Mich., with its Eastern sales office in the Morton Building, New York.

A Powerful Gasoline Blow Torch

The "Imp" torch, shown in the accompanying quarter-size illustration, is a patented device which in many locations will do the necessary work as well as some of the larger torches, with the advantage of compactness, simplicity and cheapness.

It is entirely automatic in operation, has no pump or valve, needs no tools, starts with a match and is said to give a perfectly clean, powerful Bunsen flame for over two hours on four ounces of gasoline.



The "Imp" Torch, Started by Heating Tube With a Match.

The corrugated neck increases the heating surface to such an extent that the flame of a match easily generates gas enough for starting, after which the carefully designed mixing tube is reported to render further attention unnecessary. It is made by the Frank Mossberg Company, Attleboro, Mass.

Benefits of Proper Lightning Protection

Severe damage was done by lightning in the town of Kenton, Ohio, during the storm which occurred on the night of June 21, 1908. It is reported that the Kenton Telephone Company operating there, on the following morning had only 200 lines working out of 1200. The extent of the general damage is indicated by the statement that 21 buildings were struck by lightning in the county. Of these five barns were burned and 15 horses were killed in the injured buildings. A house struck by lightning had an entire window torn out, and a hole 4 ft. square was made in the opposite side. In this house the telephone wires were burned up, but the telephone was not damaged at all. Nearly all of the fuses and cable boxes of the Kenton Telephone Company were burned out, and considerable damage was done to the wires.

In spite of all this damage it is reported that not one farm telephone out of a total of 560 was injured. This instance was reported to the Michigan Electric Specialty Company, of Muskegon, Mich., who furnish the "Vac-m" lightning arresters with which the instruments were protected, and the information is being circulated by the company as particularly interesting testimony on the value of proper lightning protection.

BROWN & WILLIAMS, patent lawyers, 1550 Monadnock Block, Chicago, Ill., announce that Mr. Adolph A. Thomas has recently associated himself with their organization. Mr. Thomas, after completing a course in chemical engineering at the Case School of Applied Science, graduated from the law school of Georgetown University. For four years he was an assistant examiner in the electrical division of the United States Patent Office, and has had considerable experience in practice before the courts. He will devote himself principally to interference cases, and to the prosecution of patent applications involving chemical, electrochemical and alternating current technique.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., has issued an interesting series of four postal cards upon which appear views of the factory and offices. These are especially well printed from excellent negatives, on a high grade of paper, and form unusually effective souvenirs of the large manufacturing plant.

THE AUTOMATIC ELECTRIC COMPANY, of Chicago, Ill., has closed a contract with the Citizens' Telephone Company, Grand Rapids, Mich., for a complete automatic equipment to be installed at Lansing. The exchange will have an initial capacity of approximately 1700 main lines and is expected to be entirely installed by the middle of December.

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Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

MR. E. J. COLBY has accepted the management of the local exchange of the Peoples' Telephone Company at Chatfield, Minn.

MR. E. S. MABIE, who is secretary of the Camden Home Telephone Company, has recently been elected manager of that company.

MR. G. F. MANSBRIDGE, superintendent of the postal telegraph factory at Pleasant Avenue, London, has returned to England after a trip to this country in the interests of his ingenious condenser. He visited New York, Philadelphia, Baltimore, Washington, Pittsburg, Chicago, Cleveland, Buffalo, Rochester, Albany, Boston and Montreal, taking passage home from the last named city. The condenser was received he says "almost with enthusiasm, and the prospects are excellent in the telephone field."

MR. S. V. McKENNAN has been appointed manager of the Central Union Telephone Company's exchange at Champaign, Ill.

MR. A. E. MORRISON, formerly superintendent of telephones for the City of Edmonton, has been appointed superintendent of the Government telephone system for Alberta.

MR. CLYDE NORTON, of Louisville, Ky., has recently accepted the position of manager of the Cumberland Telephone & Telegraph Company's exchange at Lebanon, Ky.

NEW COMPANIES

HARRISBURG, ARK.—The Going Telephone Company, which proposes to construct, maintain and operate telephone lines, has recently filed articles of incorporation. Its headquarters is to be located at Harrisburg, at which place it expects to establish both a local and long distance telephone exchange. The new company is capitalized at $50,000, over $30,000 having already been subscribed, and the incorporators are: L. C. Going, who has been elected president, B. M. Going, M. Hart, J. C. Mitchell and W. N. Harris.

PALESTINE, ILL.—Articles of incorporation have been filed by the LaMotte Co-operative Telephone Company, and arrangements are being made for the installation and operation of an up-to-date telephone system in Palestine. It has an authorized capital stock of $2,250, and among

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those responsible for its formation are: G. L. Wesner, J. G. Nelson, William J. Kirchey and others.

CONVERSE, IND.—The Converse Consolidated Telephone Company, which is capitalized at $20,000, has filed articles of incorporation, and contemplates the erection and operation of telephone lines. The incorporators of the new concrn are: T. P. Sylvan, Indianapolis; J. W. Stickney, Anderson; J. P. Goodrich, George H. Ward and J. A. Browne, of Winchester.

HILLSDALE, IND.—Owing to the dissatisfaction caused by the rates charged by the local company at this city, an Independent telephone company has been formed, and the following officers elected: D. B. Highfill, president; John Taylor, secretary; Samuel Hammersley, treasurer. A number of prominent citizens of Montezuma have signified their willingness to lend support to the new enterprise, and it is probable that work on the installation of a new system at Hillsdale, and the construction of a line between that city and Montezuma will soon be commenced.

DABNEY, KY.—Among the latest companies to file incorporation papers is the Dabney Telephone Company, of Dabney, Pulaski County. It has an authorized capital stock of $2,000, and among the incorporators are: W. H. Owens, C. A. Bishop, W. H. Price and others.

LITTLE CYPRESS, KY.—An Independent telephone company has been organized by a number of the representative citizens of this city, and the following officers elected: President, Dr. E. G. Goodloe; vice-president, W. E. Hayden, secretary and treasurer, B. J. Storey. The company, which has already secured about 70 subscribers, expects to commence the installation of a modern exchange at once, and will probably effect connections with the lines of the Home Telephone Company of Paducah.

FRASER, MICH.—The Farmers' Telephone Company has been organized, and work on its system is well under way. The company is officered as follows: President, Charles Kalkman; secretary, S. R. Marks; treasurer, John Shue.

MAHNOMEN, MINN.—Articles of incorporation have been filed by the White Earth Telephone Company, of Mahnomen. It has an authorized capital stock of $10,000, and the incorporators are: Charles H. Sanders, M. M. Sanders, Kathryne Sanders and L. G. Sanders.

RUSSELL, MINN.—Among the latest companies to file incorporation papers is the Russell Farmers' Mutual Telephone Company, of this city, whose purpose is to construct and operate telephone lines. The capital stock is placed at $10,000, and the following officers have been elected: A. J. Burckhardt, president; W. C. Henrich, general manager.

SEDALIA, MO.—The Queen City Telephone Company, the stock of which is now almost completely in control of Sedalia business men, has been refinanced and reorganized. A new switchboard, which accommodates 3,000 subscribers, has been purchased, and it is the intention of the new owners to make the plant modern in every particular.

CARSON CITY, NEV.—The Western Pacific Telephone & Telegraph Company has been organized, and articles of incorporation filed at Carson City. It is its intention to at once commence the construction of telephone lines in the counties of Modoc, Plumas and Lassen, in Northern California. Among those interested in the new enterprise are: Supreme Judge James G. Sweeney; T. F. Adams, president of the Nevada Consolidated Telephone Company, operating in Ormsby County, and Alfred Kange.

HETTINGER, N. D.—An Independent telephone company, to be known as the Hettinger Telephone Company, has been organized at this city, and work on the installation of a modern system is to be commenced at once, about 50 subscribers having already been secured. Among those actively interested in the project is E. M. Shannon, of Sanborn, who has made application for a franchise at this city, and who is also planning to establish long distance connections as soon as the local system is installed.

STARKWEATHER, N. D.—The Farmers' Telephone Company, whose principal place of business is to be located at Starkweather, has filed articles of incorporation. It has an authorized capital stock of $24,000, and among the incorporators are: M. W. Revis, J. A. Haughtelin, P. C. Gering, J. F. Quick and A. J. O'Connor, all of Starkweather.

BEALLSVILLE, OHIO.—Articles of incorporation have been filed by the Melott Ridge Telephone Company, of Beallsville, and arrangements are being made for the construction and operation of a telephone system. The capital stock of the company is placed at $3,000, and the incorporators are: A. W. Varner, C. F. McDowell, Charles Bolon, G. Pittman, R. M. Hobb and L. T. Melott.

YOUNGSTOWN, O.—The Mahoning Telephone Company, of Youngstown, which is capitalized at $10,000, has filed articles of incorporation, and expects to install a modern system at this city.

FLORENCE, ORE.—Articles of incorporation have been filed by the Coast Line Telephone Company. It has an authorized capital stock of $2,500, and among those responsible for its formation are: D. M. Kemp, C. H. Holden, C. E. Harwood and others. Its plans include the installation and operation of a telephone system in and about Florence.

BELLEVERNON, PA.—Incorporation papers have been filed by the Westmoreland & Fayette Telephone Company, which expects to construct and operate farmers' telephone lines connecting Bellevernon with Fayette City, Perryopolis, West Newton, Smithton, Monessen and Webster. The capital stock is placed at $1,000, divided into 40 shares, and is said to be now oversubscribed.

CHESTNUT MOUND, TENN.—An Independent telephone company, bearing the title of the Chestnut Mound Telephone Company, has been organized by local capitalists at this city, and the following temporary officers elected: L. C. Thompson, president; A. H. King, vice-president; J. P. Elrod, secretary; F. C. Hargis, treasurer. The organizers are planning for the installation of an up-to-date system at Chestnut Mound, and the establishment of connections with the nearby towns, and on to Nashville, by way of Gordonsville.

NASHVILLE, TENN.—From this city comes the announcement of the incorporation of the Blue Bell Telephone Company of Lawrence County. It has an authorized capital stock of $2,400, and among those responsible for its formation are: C. H. Hollins, J. M. Forsythe, E. L. Forsythe, J. Allen Litterell, W. E. Kelley, R. C. Johnson and G. W. Sweanney.

VANCOUVER, WASH.—The franchise of the Washington Home Telephone Company in this city has been purchased by H. J. Roake, who, in connection with several of the representative business men of this city, expects to organize a new telephone company. Construction work upon an exchange is to be commenced at once, the money to be raised by Vancouver men, and no bonds to be sold. The company, which is to be officered by local men, expects to have its plant in operation by January 1.

SLANESVILLE, W. VA.—Articles of incorporation have been filed by the Slanesville Telephone Company, of this city, and plans are being discussed for the installation and operation of a telephone system in Slanesville and throughout Hampshire County. The company is capitalized at $5,000 and among the incorporators are: T. D. Bloom, G. W. Spicer, H. E. Streby, Spring Gap, T. F. Henderson, Slanesville, and A. W. Miller, of Cacapehon.

WILLIAMSON, W. VA.—The Lawson Telephone Company, which has a capital stock of $10,000, has filed articles of incorporation, and contemplates the construction of about 100 miles of line. Harry Lawson, who has been elected president of the company, and others are among the incorporators.

VERNON, W. VA.—Articles of incorporation have been filed with the secretary of state by the Farmers' Rural Telephone Company, which proposes to install and operate a telephone system in Vernon and throughout Wetzel County. It has an authorized capital stock of $5,000, and among those interested in the new project are: Jacob Schupbach, G. W. Yost, Albert Schupbach and Adolph Durig, of Vernon, and G. J. Bothesberger, of New Martinsville.

HARRISTON, ONT., CAN.—The Minto Rural Telephone Company, Limited, which has an authorized capital stock of $10,000, and contemplates the construction and operation of a telephone system in the township of Minto, in the northwestern part of the County of Wellington, has filed articles of incorporation. Its principal place of business is to be located in Harriston.

STONY CREEK, ONT., CAN.—Plans are being discussed at this place for the organization of an Independent telephone company. Among those interested in the new project are: Camby Wismer, of Jordan, and Levi Moyer, of Beamsville.

WHEATLEY, ONT., CAN.—Articles of incorporation have been filed by the Wheatley Telephone Company, which was organized some little time ago, and which has already installed an exchange at this city. Its purpose is to conduct a telephone business in the townships of Mersea and Romney, Essex County. The company is capitalized at $20,000, and the following directors have been elected: F. J. Fox, N. Coles, Oscar Lounsbury, Robert Goodison, J. H. Allan, J. A. Campbell and A. M. Wilson, all of Wheatley.

FRANCHISES

SANTA CLARA, CAL.—Permission has been granted to J. S. Bogart to construct a telephone line along the Santa Clara-Alviso road from Santa Clara to the Omar Oaks ranch.

WILLOW, CAL.—Application for a franchise to install a telephone system at this city has been made by Glenn County Telephone Company, which is now constructing a system throughout the county, the company being represented by H. J. Barceloux, president, and A. S. Lindstrom, a stockholder.

PENSACOLA, FLA.—The ordinance known as the telephone rate measure, recently passed by the City Council, has been approved by the Mayor and becomes effective at once. Under the provisions of this ordinance the Mayor is empowered to sign a contract with the Southern Bell Telephone & Telegraph Company for telephone service in Pensacola for an indefinite period, but it does not give to that company the exclusive right to operate in this city, its purpose being to regulate the rates charged by the Bell Company. This action has been brought about by the increase in rates made by the Southern Bell Telephone Company some time ago, and its promise to reduce them if an agreement similar to the one mentioned above could be arrived at.

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SPIRIT LAKE, IDAHO.—The trustees of the town of Spirit Lake, of which W. T. Hireen is chairman, have granted to the Rocky Mountain Bell Telephone Company a franchise to enter the town, a provision of the franchise being that the Rocky Mountain Company shall make an arrangement with the Spirit Land Company similar to that made with the Interstate Company by the Land Company, namely, to use the poles of the latter company, thus having only one line of poles through Spirit Lake.

BUFFALO, MINN.—A franchise at this city has been granted to the Tri-State Telephone Company to establish toll service.

ONEIDA, N. Y.—It is stated that a new Independent telephone company is to apply to the Common Council of this city for a franchise permitting it to install and operate a telephone system in Oneida. While the names of the promoters have not been made public, it is understood that a number of local capitalists are interested in the venture. Assurances have been given that if the franchise is granted work will be commenced at once on an exchange at this city and connections with Syracuse, Utica and other nearby places established.

WOODWARD, OKLA.—At a recent meeting at this city a franchise was granted to the Independent Telephone Company, the vote being 229 to 85.

HUGHESVILLE, PA.—Application for a franchise to install and maintain a telephone system within the borough limits has been made by the People's Ideal Telephone Company. The application was favorably received by the Council, and it is believed the privileges asked will be granted very shortly.

FINANCIAL

INDIANAPOLIS, IND.—The Indianapolis Telephone Company has filed its semi-annual report with the City Controller, and paid the city $5,510, the amount due for the privilege of operating 8,510 telephones. Under the franchise the company is required to pay the city $1.00 a year on each telephone up to the first 6000, and then $2.00 a year on each teleprone over 6,000.

DES MOINES, IA.—The amount of the semi-annual interest due Aug. 1 on its outstanding 6 per cent 10 year gold bonds has been paid by the Mutual Telephone Company to the Iowa Loan & Trust Company, and the various owners will receive the interest due by presenting the coupons to the Iowa Loan & Trust Company, or by depositing them with any bank. The Mutual Company's business is growing at a rapid rate, it now having 6,500 telephones in operation.

MILBURN, KY.—The capital stock of the Milburn Independent Telephone Company, of Carlisle County, has been increased from $1,000 to $2,500.

DETROIT, MICH.—The Michigan State Telephone Company has declared its regular quarterly dividend No. 19 of 1½ per cent on the preferred stock, payable Nov. 2. The company has also declared its quarterly dividend No. 3 of 1 per cent on the common stock, payable Sept. 1.

GRAND RAPIDS, MICH.—The forty-fourth quarterly dividend of 2 per cent, payable July 20, has been declared by the Citizens' Telephone Company.

OMAHA, NEB.—A mortgage for $6,600,000, to secure a bond issue for a like amount, has been placed on file by the Long Distance Independent Telephone Company, the toll line auxiliary to the Independent Telephone Company. The mortgage runs to the American Trust & Savings Bank of Chicago, trustee, and covers all lines, exchanges, plants and other property of the company, or which it may acquire, but does not include the capital stock of other companies owned by this company. It is estimated that $500,000 of the bond issue is to be delivered by the trustee to such persons as the officers may direct, and the rest to be held in trust, to be delivered from time to time as disposed of.

BRIDGEPORT, OHIO.—The capital stock of the Belmont Telephone Company, of Bridgeport, has been increased from $150,000 to $250,000.

WOOSTER, OHIO.—Its regular quarterly dividend of 1½ per cent has been declared by the Millersburg, Wooster & Orrville Telephone Company.

CALIFORNIA, PA.—A statement submitted to the stockholders of the Union Telephone Company at the annual meeting of that company showed its stock during the past year has paid 7 per cent. The lines of the company now extend to Pittsburgh, Uniontown and numerous other points in Washington and Fayette Counties.

CHARLESTON, W. VA.—At a recent meeting of the directors of the Charleston Home Telephone Company, the thirteenth quarterly dividend of 1½ per cent was declared.

ROSENDALE, WIS.—The Rosendale Telephone Company, of this city, has filed an amendment to its charter increasing its capital stock from $5,000 to $10,000.

CONSTRUCTION

POMONA, CAL.—A new switchboard has been installed by the Chino Home Telephone Company at this city, and many other improvements in its system are being considered.

ROSEVILLE, CAL.—The lines of the Pacific States Telephone & Telegraph Company are being thoroughly overhauled and rebuilt in Roseville.

SELMA, CAL.—The toll lines of the Pacific Telephone & Telegraph Company entering Selma are being entirely reconstructed, and additional ones built.

BRISTOL, CONN.—A new exchange building is being erected at this city by the Southern New England Telephone & Telegraph Company, in which a common battery system is to be installed.

MIDDLETOWN, CONN.—A new exchange building is being erected at this city by the Southern New England Telephone & Telegraph Company, in which the most up-to-date equipment is to be installed.

WALLACE, IDAHO.—The North Idaho Telephone Company, which is installing an exchange in this city, is also extending its lines in Kellogg and Wardner.

GALESBURG, ILL.—The completion by the Galesburg Union Telephone Company of a line to Yates City, where connections have been established with the Interstate Telephone Company's lines, gives the Galesburg Company service to Peoria, Decatur, Bloomington, Urbana, Champaign, St. Louis and other Southwestern points. Work is to be commenced at once on the construction of a line to Kewanee.

KEWANEE, ILL.—Among the extensions planned by the Home Telephone Company of this city is the construction of a copper toll line from Kewanee to Princeton, Henry and Sterling, which will add about 50 additional miles of line to its system.

TOLONO, ILL.—Work on the construction of its line at this city is soon to be commenced by the Home Telephone Company, and arrangements are also to be made for the erection of a line from Pesotum to Champaign.

HUNTINGTON, IND.—The United Telephone Company, which has just completed a line to Mt. Etna, contemplates the construction of a toll line from Huntington, through Mt. Etna, to Marion.

PLEASANTVILLE, IA.—A new exchange has been installed at this city by the Iowa Telephone Company, and connections established with Altoona, Colfax, Mitchellville, Runnells and a number of other places.

LEXINGTON, KY.—About $60,000 is to be expended by the Fayette Home Telephone Company in the installation of a new switchboard and other contemplated improvements in this city.

SERGENT, KY.—A new switchboard has been installed at this city by the Letcher County Home Telephone Company, and connections are to be established with the new line recently completed to Evans and Hilliard. In the immediate future a larger board is to be installed, to take care of the company's rapidly increasing business, and its lines extended in a number of different directions.

LANSING, MICH.—About $55,000 is to be expended by the Citizens' Telephone Company for the equipment to be installed in the new exchange which it is now erecting at this city.

NEVIS, MINN.—A number of rural lines south of this city are being erected by the Nevis & Southern Telephone Company to take care of its increasing business.

KANSAS CITY, MO.—The completion of the American Telephone & Telegraph Company's line between Kansas City and Denver establishes service with Topeka, Hutchinson and Garden City, in Kansas, and Holly, Lamar, La Junta, Pueblo and Colorado Springs in Colorado.

OMAHA, NEB.—Ten thousand dollars is the sum expended by the Independent Telephone Company for an exchange site in South Omaha.

IRONA, N. Y.—Several new lines are being constructed in this city by the Hudson River Telephone Company.

NEW YORK, N. Y.—A telephonic train dispatching system is to be installed by the Delaware, Lackawanna & Western Railroad. The work of installing the new system is under way, and on some divisions will be adopted within the next month. On others the installation may be delayed somewhat, but work is to be carried on as rapidly as possible.

WAVERLY, N. Y.—The lines of the Ellistown Telephone Company are being extended in and about this city.

STARKWEATHER, N. D.—Work on the construction of its system in Starkweather is being carried on by the Farmers' Telephone Company at a rapid rate.

MIDDLETOWN, OHIO.—The Middletown Telephone Company is planning to expend about $50,000 in the improvement of its plant at this city. A new switchboard is to be installed, and the system made modern in every particular.

NEW LEXINGTON, OHIO.—The Perry County Telephone Company is planning to make many improvements in its plant at this city. Its lines are to be thoroughly overhauled and new ones erected, the estimated cost of the work being in the neighborhood of $4,000.

SIDNEY, OHIO.—The Sidney Telephone Company is planning for the installation of a new central office at Sidney.

KLAMATH FALLS, ORE.—Arrangements are being made by the Midway Telephone & Telegraph Company for the reconstruction of its line between Klamath Falls and Bonanza.

McMINNVILLE, ORE.—The construction of a line to Portland, where connections are to be established with the Home Company of that city, is to be commenced at once by the newly organized McMinnville

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Local & Long Distance Telephone Company. Work is to be commenced at Sherwood, one crew working towards Portland and the other in the direction of McMinnville.

MT. AETNA, PA.—A line connecting Mt. Aetna with Myerstown and a number of other nearby towns has been erected by the Mt. Aetna & Bethel Telephone Company, and other extensions are to be made.

GREENVILLE, S. C.—The Southern Bell Telephone & Telegraph Company, which has completed lines from this city to Easley, Liberty, Pickens and Greer, contemplates the erection of lines from Greenville to Columbia, Anderson and Clinton.

TREZEVANT, TENN.—Long distance connections between this city and McKenzie have been established by the Trezevant Telephone Company, and other construction work is planned.

CHILDRESS, TEX.—The Southwestern Telegraph & Telephone Company is rebuilding its long distance line between Childress and Fort Worth. Upon the completion of its work, it expects to make material improvements in its plant at the former city.

HOCKLEY, TEX.—The Southwestern Telegraph & Telephone Company, which has just completed a line to Hockley, expects to extend its system to Waller.

PRAIRIE LEA, TEX.—Construction work upon a telephone line from Prairie Lea to the Truck Smith community in Guadalupe County has been commenced by Jack McKearn, of the former city.

PETERSBURG, VA.—The lines of the Dinwiddie County Telephone Company are being extended in and about this city.

CHARLESTON, W. VA.—The Home Telephone Company, which has already expended $40,000 in the improvement and extension of its system, is arranging to enlarge its local plant, to permit of the addition of 800 new subscribers, and to build an entirely new pole lead, carrying four copper circuits, to Clendennin, at which place connections are to be established with the Parkersburg Independent Telephone Company.

GILBERT, W. VA.—The Gilbert Telephone Company, which has constructed a line to Logan and Williamson, expects to make other extensions in its system.

PIKE, W. VA.—At a recent meeting of the Finch Telephone Company it was decided to build a line from Pike to League, also a branch line from Pike to Highland. This new work, which is to be commenced in a short time, will, when completed, add greatly to the rapidly growing business of the company. Plans are being made by the different operating companies in Hebron to install an exchange at that place in the near future, which will be under the control of the Finch Telephone Company.

JEFERSON, WIS.—To take care of its rapidly increasing business, the lines of the Jefferson Mutual Telephone Company are to be extended to the town of Oakland, also on both the east and west river roads to Fort Atkinson, and the main road to Johnson Creek.

REEDSVILLE, WIS.—A new switchboard is to be installed at this city by the Rockland Telephone Company, and connections established with the lines of the Manitowoc & Western Telephone Company at Maple Grove.

RICE LAKE, WIS.—To accommodate its new subscribers at this city, about 10,000 ft. of additional cable is to be strung by the Barron County Telephone Company.

CYPRESS RIVER, MAN., CAN.—Signatures have been obtained for a sufficient number of subscribers for the building of a rural telephone system here, and work is to be commenced at once. Address J. E. Morecombe, Cypress River, Manitoba.

PRINCE WILLIAM, N. B., CAN.—The lines of the New Brunswick Telephone Company are to be extended from Prince William to Harvey Station, via Dumfried.

COLD SPRINGS, ONT., CAN.—The Hamilton Township Rural Telephone Company, with its central office at Cold Springs and direct connection with Cobourg, is making further extensions in its system.

GANANOQUE, ONT., CAN.—The Pittsburgh & South Leeds Telephone Company, recently incorporated, is making arrangements to commence the construction of its system at once.

QU' APPELLE, SASK., CAN.—Farmers living in Qu' Appelle Valley and Hazel Cliff districts are installing a rural telephone system.

SPRINGSIDE, SASK., CAN.—Arrangements are being made by the Yorkton, North West Telephone & Electric Light Company for the installation and operation of a telephone system in this city.

ELECTIONS

PETERSBURG, IND.—At a recent meeting of the stockholders of the Independent telephone companies operating and owning systems in Pike, Warrick and Dubois Counties, the following officers were elected: President, Dr. J. W. Coleman; vice-president, G. C. Thomas; secretary, W. D. Oad; treasurer, Dr. J. Nichols. A full board of directors, headed by G. J. Nichols, was also elected. Reports from the several counties in which the systems operate show a greatly increased business over last year, and the stock has advanced almost 20 per cent.

SCOTTSBURG, IND.—The following officers have been elected by the Scott County Telephone Company; Mark Storen, president; F. H. Park, vice-president; John Montgomery, secretary; Ezra Thomas, treasurer; Ira Parker, superintendent; Charles E. Guernsey, general manager. The directorate is made up of the above-named officers.

SYRACUSE, N. Y.—The following officers have been elected by the Onondaga Independent Telephone Company: Alexander H. Cowie, of Syracuse, president; John B. Pierce, manager of the old Independent Telephone Company of Syracuse, general manager and assistant treasurer; George R. Fuller, of Rochester, vice-president; W. Roy McCanne, secretary and treasurer. The other directors are Henry S. Holden, of Syracuse; Joseph W. Taylor and E. W. Peck, of Rochester.

CALIFORNIA, PA.—The following officers and directors have been elected by the Union Telephone Company: President, W. C. Smith; secretary, V. J. Weaver; treasurer, H. L. Lamb; directors, E. C. Smith, T. J. Underwood, R. B. Drury, H. L. Lamb, W. J. Weaver, A. White and R K. Richardson.

PROSSER, WASH.—At a recent meeting of the Benton Independent Telephone Company, which is composed of ranchers, the following directors were elected for the year: I. W. Carter, T. J. Stockdale, J. M. Hoagland, C. E. DeBow, R. H. Bone, J. T. Jackson, D. T. Smith and George C. Lincoln. The company expects to soon commence the installation of an exchange at Prosser.

RITZVILLE, WASH.—The following officers and directors were elected by the Washtucna High Line Telephone Company at a meeting held in this city: B. L. Sutton, president; E. H. Wyrick, vice-president; Robert West, treasurer; William Snyder, secretary; directors, E. H. Herring, V. T. Donald and Dr. J. W. Sherfey.

MULL, ONT., CAN.—The following directors have been elected by the newly organized Farmers' Long Distance Telephone Company: M. Newcombe, Blenheim; John Whittington, Harwich; Dr. Storey, Blenheim; A. Huffman, Huffman's Corners; Dougald McCoig, Mull.

ORONO, ONT., CAN.—At a recent meeting held at this city of the Durham Union Telephone Company the following officers were elected: Albert Walsh, president; Dr. Tucker, vice-president; Dr. Colville, secretary.

MISCELLANEOUS

CAMBRIDGE CITY, IND.—The Central Union Telephone Company has discontinued its toll station at this place, the Citizens' Company having control of all lines.

DETROIT, MICH.—At a recent meeting of the stockholders of the Home Telephone Company the company's plant was taken over from the builders, the Electric Construction Company, of St. Louis, which, in addition to constructing the plant, has been operating it up to the present time. The Home Company is now in charge, and has elected the following officers: President, Fred T. Moran; vice-president, Henry Koehler, Jr.; secretary and general manager, A. E. Barker. The company, which reports excellent business for the first six months of the year, has expended about $2,000,000 in construction work.

CHESTER, S. C.—The local telephone exchange of the Independent Telephone Company at this city was wrecked during a recent fire, the switchboard and other equipment having been completely destroyed.

CLARKSVILLE, TENN.—As a result of the filing of a bill in the Federal Court at Nashville by the United States Trust Company, a Louisville corporation, petitioning for a receivership for the Home Telephone Company, of Clarksville, Judge Sanford, of Knoxville, has granted the receivership, and appointed Ernest B. Denison, local manager for the Home Telephone Company, temporary receiver. It is stated that the business of the company, which operates exchanges in Montgomery, Houston and Stewart counties, will be continued without any change whatever pending its reorganization, which is to be effected at as early a date as possible.

SPOKANE, WASH.—A $50,000 interest in the Interstate Telephone Company of Spokane, of which M. A. Phelps is president, and J. W. Fisher is general manager, has been acquired by Thomas L. Greenough, a heavy property owner in Spokane, and mine operator in the Coeur d' Alenes and Montana. One of the new projects of the company is to extend its line in the Coeur d' Alenes from Wallace to Mullen, Idaho, and on to the Snowstorm mine, a distance of 10 miles. More than 800 miles of line is now owned by the company, most of it in Idaho. A 35-mile extension is now being made from Rathdrum to Newport, Wash., which, with the Mullen extension, will represent an expenditure of $15,000. During the coming year it is the company's intention to construct a line from Spokane to Lewiston, Idaho, a distance of 147 miles.

CHATHAM, ONT., CAN.—A movement is on foot here to organize a local Independent telephone company.

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Metropolitan Life Building MINNEAPOLIS, MINN.

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Installers of Switchboards and Cable Apparatus

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will reach the men you are trying to do business with—a larger number of them than through any other publication.

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742 Ohio Building TOLEDO, O.

FOR SALE

This column is open only to operating companies to sell telephone plants or second-hand apparatus. The rate for advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

FOR SALE—Having changed our plant from a magneto to a common battery, we have a number of magneto telephones for sale for less than half price; Stromberg-Carlson and Chicago Telephone Supply make; in good condition. Home Telephone Co., Goshen, Ind. 1142

POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

POSITION WANTED—By a strictly first-class, up-to-date telephone manager and const. man; 12 years' experience from the ground up. Specialty, overhauling run-down plants. Present position, manager 900 telephones. Highest recommendations. Will give you my services 30 days free if I don't deliver the goods. Salary $80. West preferred. Address H., care of Downing Electric Company, Fort Dodge, Iowa. 1124

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

COMPANIES wanting a manager who will improve their service and save them money should answer this ad; experienced manager and electrician with technical training. Address Lock Box 363, Decatur, Ill. 1141

POSITION WANTED—Married man, 35 years old, 12 years' experience in magneto work, wants position as manager of exchange of 1000 subscribers or under; references. Address Box 178, Muscatine, Ia. 1139

POSITION WANTED as manager of a small branch exchange; will also act as trouble man, inspector and collector; age 29, married, 7 years' experience; prefer magneto system; can furnish strictly first-class references. Address Box 80, R. F. D. 6, Towanda, Pa. 1143

POSITION WANTED by experienced switchboard electrician, who can do all kinds of telephone work from that of trouble-man and lineman up; 9 years' experience; good references. Address Box 1140, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York

POSITION WANTED by A1 construction man, who has had 12 years' experience in all branches, and who knows how to handle men and build a plant from A to Z. Address Box 1144, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED by first-class cable splicer; one who can take charge of work and handle men; one who knows what cable work is. Address Box 1145, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

HELP WANTED

The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone and electrical supply salesman to carry our side line. Vest pocket sample. Address Box 1131, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED—A good wire chief and switchboard man on an exchange of 1000 to 1500 subscribers in the West; must be a good cable and construction man; one who can get the work out of the men and keep trouble up without kicking; state salary wanted. Address Box 1138, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED

The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.

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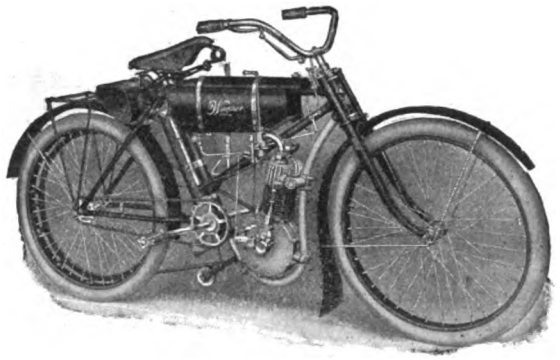


The Wagner Motorcycle

SIMPLE PRACTICAL ECONOMICAL

The quick transportation for

Lineman, Inspector, Collector, "Trouble-shooter"

Descriptive catalog and particulars of our special proposition to the Telephone Trade upon application.

Wagner Motorcycle Company

St. Paul, Minn.

We have on hand newly manufactured, guaranteed apparatus of all makes

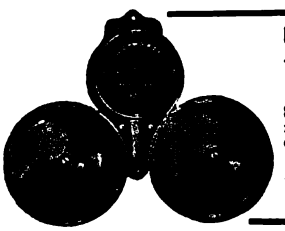
Telephones, Switchboards and Supplies

which we can sell to you at a reduction of 40% to 50% in price. Write us to-day.

We rebuild all kinds of telephone apparatus. Make it as good as new. Consult our repair department.

Missouri Valley Telephone & Electrical Construction Co.

123-25 West 6th St., Kansas City, Mo.



Magneto LOUD RINGING Extension

TELEPHONE BELLS

Size of gongs, 6 in., 7 in., 8 in., 9 in., 10 in. All resistances. All weather proof. Efficiency, durability and price will interest you.

SCHWARZE ELECTRIC COMPANY

Main Office and Factory: Adrian, Michigan

TELEPHONE EAR CUSHION Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the ear-drum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash! crash! noises. Made by

HURON RUBBER COMPANY, CLEVELAND, O.

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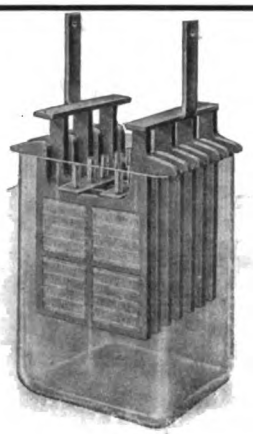
HIGH DUTY

This is our Size D-7

Capacity 66 ampere hours or about 4000 calls on a Central Energy System.
We make cells that will fit any requirements.



General Storage Battery Co.

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ANDREWS STEEL ROD TELEPHONE

Operator's Revolving Chair

No. 78 M.

Steel Foot Rest—Seat and Back readily adjustable to occupant—Height of Chair easily regulated. Frame work made of Bessemer Steel, 3/8 (three-eighths) inch rods twisted and interwoven. Wood work, oak, birch or mahogany finish, as preferred. Metal work heavily plated, Japanese copper finish.

The Most Comfortable High Chair Made

The Most Attractive and Convenient

INDESTRUCTIBLE

Nothing to get broken

24-inch high 28-inch high

Warranted for 10 years. Send for complete Catalogue and Prices

The A. H. Andrews Co.

174-186 Wabash Ave.
Chicago, U. S. A.

No. 75 M. Toll Board Chair.

Every Trouble Man

ought to have one of the

"CONNECTICUT" Pocket Meters

in his kit. They make battery-testing easy. Durable, accurate and low in price.

VOLTAMMETER. 0-6V, 0-30 amp., $5.00
AMMETER, 0-30 AMP., . . . 3.50

Circular T describes all sizes. Write for a copy.

CONN. TELEPHONE & ELECTRIC COMPANY, Inc.

MERIDEN, CONN.

WESTON

STANDARD PORTABLE DIRECT READING

VOLTMETERS, AMMETERS, MILLIVOLTMETERS, VOLTAMMETERS, MILAMMETERS, OHMMETERS, PORTABLE GALVANOMETERS, GROUND DETECTORS AND CIRCUIT TESTERS.

Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS and AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy

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London Branch—Audrey House, Ely Place, Holborn.
Paris, France—E. H. Cadiot, 12 Rue St. Georges.
Berlin—European Weston Electrical Inst. Co., Ritterstrasse No. 88.
New York Office—74 Cortlandt Street.

Weston Standard Portable Direct Reading Voltmeter. Model 1.

Trouble on Your Lines?

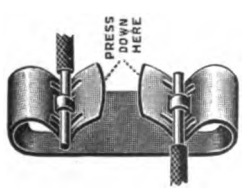
Find It with a Voltmeter.

The new Pignolet catalog tells you how, and contains other information that is worth money to any live telephone man.

The catalog is without price. Why not write for it?

Louis M. Pignolet

80 Cortlandt St. - New York



Fahnestock "Snap-Over" Connector

For connecting bridging phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.

FAHNESTOCK ELECTRIC CO.

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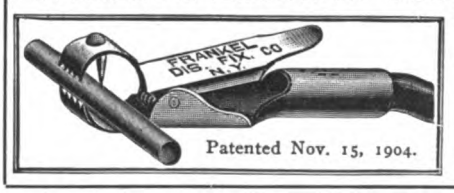

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Sample Doz. - 12½ Cts. Each
100 Lots - - 11 " "
500 " - - 10 " "
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Insulated Staples

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TUBE FLUX for SOLDERING

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COMPRESSED CLEATS FOR USE ON PLASTERING

Exact Size Pat. July, 1906

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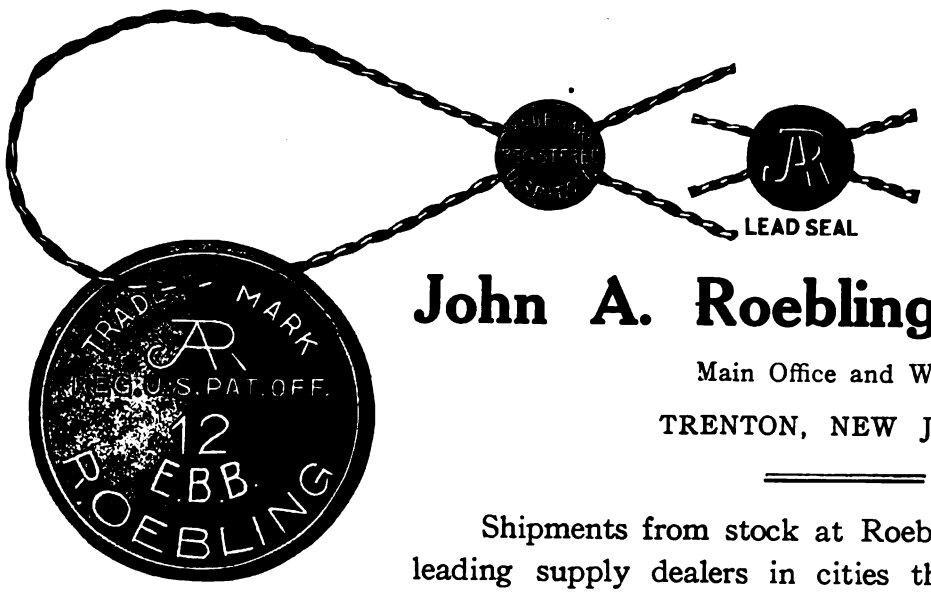
ROEBLING DOUBLE GALVANIZED TELEPHONE WIRE



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Shipments from stock at Roebling warehouses and by leading supply dealers in cities throughout the country.

LOOK FOR THE ROEBLING SEAL ON EVERY BUNDLE

LOCKE
AERIAL
RINGS
(PATENTED)

for cable suspension and distribution purposes.

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EVERETT, MASS.

Invented by a telephone man

who knows from practical experience what a lightning arrester should be—

"VAC-M" LIGHTNING ARRESTER

No noise; no exposed arc; withstands the heaviest discharge; affords perfect protection.

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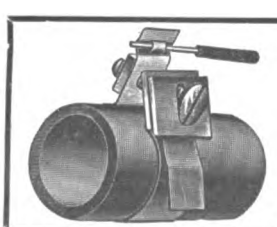
CARBON 95% PURE

Our imported granular carbon will carry, without frying, three times the amount of current required. Carbon brushes, self oiling. "Remey" magnet steel—the world's standard. Imported tin foil. Copper thread. Condenser paper—the most perfect made. Mica.

W. J. Burns & Co., Agents for Factories—Foreign and Domestic **509 Northwestern Bldg., Chicago**



M. & B. Ground Clamp

Patent applied for.

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Security Splicing Devices

and any lineman can wipe a joint. Besides securing better and less expensive unions you have the incalculable advantage of ability to inspect the sleeve or pot head easily and quickly, at any time.

Prices are low. Booklet Three gives them.

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"Wire Rope Thimbles"

We manufacture Wire Rope Thimbles and have a large stock of these made up, so that we can make immediate shipment of your orders, and our prices are right.

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BRASS, BRONZE AND COPPER

IRONITE

IDEAL DUPLEX DROP WIRE
In the "dog days" IRONITE won't sag or stretch. *Always* costs less than copper.

GET A SAMPLE
DURANT ELECTRIC SUPPLIES CO., 52 Fifth Ave., Chicago, Ill.

TAKE A POINTER
FROM US

¶ Buy **Quality Braided Tinsel Cords** that last. Do not be misled to believe that a greater number of TWISTED **brass tinsel** or even **copper tinsel** threads makes a **stronger cord.**

STROMBERG CARLSON
Registered Trade Mark

¶ We make CORDS that are designed to give **unlimited service.** You do not buy cords for the **amount** of material they contain, but for **the wear and service** they give.

¶ **To prospective customers:** order a supply now—if you do not need them to-day, you are liable to any time.

STROMBERG-CARLSON TELEPHONE MFG. CO.
Rochester, N Y. Chicago, Ill.

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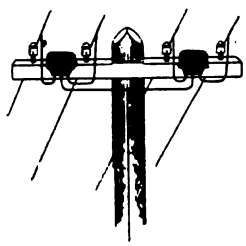
Quality Cable Talks!

¶ You can't expect to get the best talking results unless Quality Aerial and Underground Cable is used. STROMBERG-CARLSON Cables are fully guaranteed — manufactured in our own factory using commercially pure 98% soft drawn copper wire, especially annealed—insulated with a single or double wrapping of pure manila hemp paper of uniform strength, thickness and color and encased in pure lead sheath with percentage of tin if specified.

¶ Every operation in the making, from insulating—twisting—forming core—baking in vacuum oven — sheathing — reeling — and inspecting is under our direct supervision. WE TEST EACH WIRE AGAINST THE BUNCH AND SHEATH GROUNDED USING 500 VOLT D. C. AND GUARANTEE AN **AVERAGE ELECTROSTATIC CAPACITY** AS SPECIFIED IN YOUR ORDER.

¶ This is a good time to place your order. Our prices will be satisfactory and delivery prompt.

STROMBERG-CARLSON TELEPHONE MFG. CO.
ROCHESTER, N.Y.



In Ancient Times

a feather bed was supposed to offer the best lightning protection.

THE MODERN METHOD

is to use

Chapman Lightning Arresters

All the big boys are using them

Manufactured by

Minnesota Electric Co.

Minneapolis, Minn.

H. E. COBB, Selling Agent

1530 Monadnock Bldg. Chicago, Ill.

THE FAULTLESS ARRESTER

The Sky Rocket Arrester

Experts acknowledge that our choke retardation coil principle is the most reliable form of lightning arrester We use 48 inches of wire exposed to the grounded tube, with only thin air space separating. It is inexpensive, easily installed, and there is no further expense.

Prices and details await you. Write.

CHANCE MANUFACTURING CO.

CENTRALIA, MO., U. S. A.

CABLE TERMINALS

¶ This is one of our Specialties. They combine low first cost and maintenance with absolute protection.

¶ Use our **Galvanized "T" Brackets** for two and four pairs of wires for distributing.

¶ Ask for samples and booklet of Construction Specialties.

MOUNTAIN STATE ELECTRICAL CO.

Wheeling, W. Va.

No. 700. American Aerial Arrester

Price, 35c Each

It Keeps the Lightning Out

Lightning currents coming upon the line wire and reaching the arrester flow through the two line clips mounted upon the brass shell. Inside this shell is a carbon rod, its outside surface being very close to the inside surface of the brass shell. The lightning jumps across the small air gap from the brass shell to the carbon ground rod and thence flows off harmlessly to the earth through the end clip and the ground wire.

AMERICAN ELECTRIC FUSE CO.

Muskegon, Mich.

EASTERN SALES OFFICE, MORTON BLDG., NEW YORK, N. Y.

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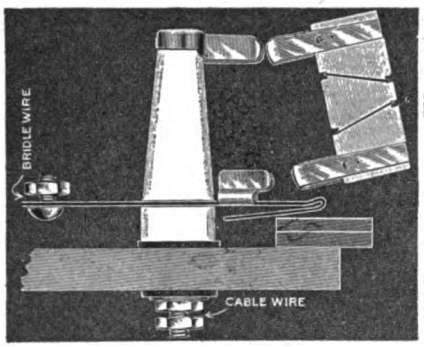


Our New Fuse Connection

Porcelain Copper Bronze
German Silver Carbon Mica

You, an experienced Telephone Man, know the meaning of these words.

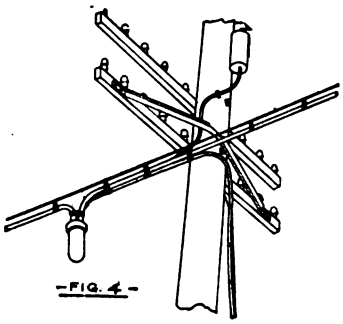
Absolute Protection,
Practically Indestructible.

All fuse terminal heads are now equipped with this new type of connection.
Would you like to know more about it? Drop us a card for sample.

MOON MFG. CO.
Chicago, Ill.

Matthews' Cable Splicing Joints

(Formerly called Hargis Joints)



Patented Oct. 17, 1905

Patent Number 802,337

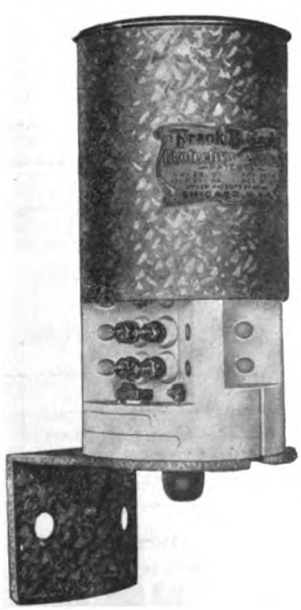
Fig. 4 shows a No. 3 Matthews' Joint used for joining together a main cable of 200 pairs, a 150 pair extension and two tap cables of 15 and 25 pairs respectively, with 10 pairs left "dead" for future use. Either one of these 10 pairs may be utilized in the taps or extension cable as required. This drawing was made from a photograph furnished us by R. Cline, Supt. of Construction of the Central Union Telephone Co. of Indianapolis.

If MATTHEWS' JOINTS save money for hundreds of others why should they not do so for you?

Send for free booklet on cable splicing.

W. N. MATTHEWS & BROTHER
Manufacturers of Patented Money-Saving Specialties
214 NORTH SECOND STREET ST. LOUIS

COOK TERMINALS and JUNCTION BOXES



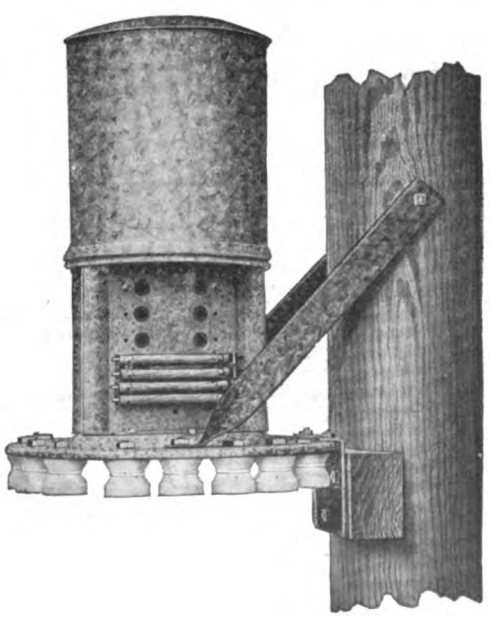
TYPE M-4 COOK PORCELAIN TERMINAL

Nothing could be better adapted to real, practical service than Cook Specialties.

They have made good in every case.

Why not write for details? It's worth while.

Frank B. Cook
CHICAGO ILLINOIS
238 WEST LAKE STREET



TYPE T-21 COOK ALL STEEL TERMINAL

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National Pole Company

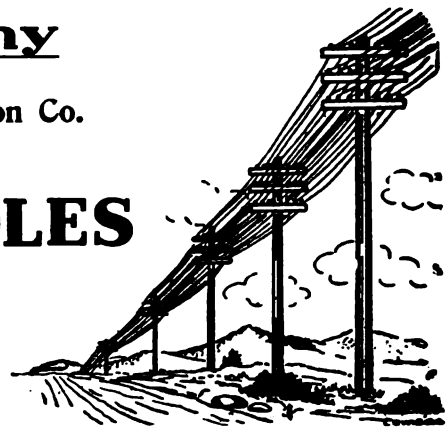
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from Maine to Washington

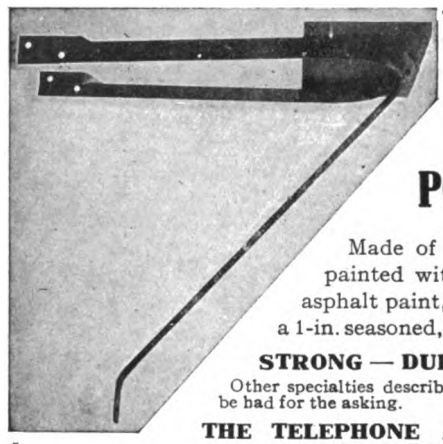


Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.

Tribune Building, Chicago



$1.00 YANKEE POLE SEATS

Made of 1½-in. angle iron painted with a weather-proof asphalt paint, to which is bolted a 1-in. seasoned, creosoted pine seat.

STRONG — DURABLE — CHEAP

Other specialties described in our bulletin may be had for the asking.

THE TELEPHONE APPLIANCE CO.
MINNEAPOLIS, MINN.

WHY SHOULDN'T WE GET YOUR POLE ORDERS?

BISSELL Idaho and Michigan **CEDAR POLES**

are exceptionally high grade. A large and complete stock means quick shipment. And our prices are business getters.

Just Ask for Leaflet Number Three

THE F. BISSELL COMPANY, Toledo, O

WHITE CEDAR POLES

LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—

YARDS: MENOMINEE, MICH; ESCANABA, "; SUPERIOR, WIS.; DEER RIVER, MINN.

FRANCIS BEIDLER & CO.
CHICAGO, ILL.

Northern White Cedar **POLES**

ITASCA CEDAR COMPANY
Deer River, Minn.

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 26 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Bayne Falls. W. C. Sterling & Son Co., Monroe, Mich.

POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY

FARIS & MAYHEW LUMBER & POLE CO.

202 & 203 Continental Building, Denver, Colo.

WHITE CEDAR POLES

Buy from the Producers and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

WHITE CEDAR POLES

Prompt Shipment Best Grade

Standard Cedar & Lumber Co.

34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

POLES AND PILING Chestnut, Red Cedar and Cypress Lengths 16 to 65 feet

J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.

PORTER CEDAR CO., Saginaw, Michigan

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Evidence of our ability to meet all trade demands:

New customers constantly coming our way

POLES

We have the "goods" and the facilities for supplying you promptly at right prices.

Duluth Log Company

General Offices: Second Floor, Palladio Bldg.
Duluth, Minnesota

The Valentine-Clark Ce.

ERNEST L. CLARK, President

Michigan / Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.
Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE
234 La Salle Street — Chicago, Ills.

DOTY LUMBER AND SHINGLE CO.

Manufacturers of
Washington Fir
Cross Arms. Red
Cedar Poles and Piling.
In any length.
PROMPT SHIPMENTS
Doty, Washington

LARGE LOTS of LONG POLES

Well Seasoned White Cedar
Immediate Shipment
J.W. Morrison Lumber Co.
General Office: 919 Lumber Exchange, Minneapolis

IDAHO AND MICHIGAN
CEDAR POLES
Large Stocks (10 Yards) Low Prices
Idaho Red Cedar Poles Our Specialty
Western Lumber & Pole Co.
SUITE 415 CHARLES BUILDING - - DENVER, COLO.

CEDAR POLES

Have a large stock. Write us for delivered price.

MARSHALL H. COOLIDGE CO.
826 Metropolitan Bld. - - - - MINNEAPOLIS, MINN.

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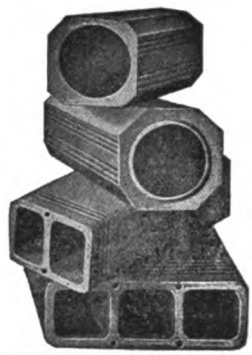
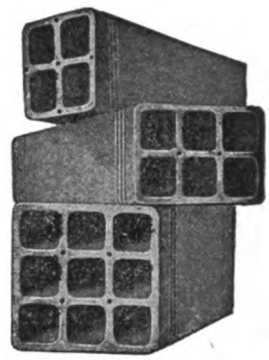


VITRIFIED

CLAY CONDUIT

SINGLE and MULTIPLE DUCT

IMMEDIATE DELIVERY ON ALL STANDARD SIZES

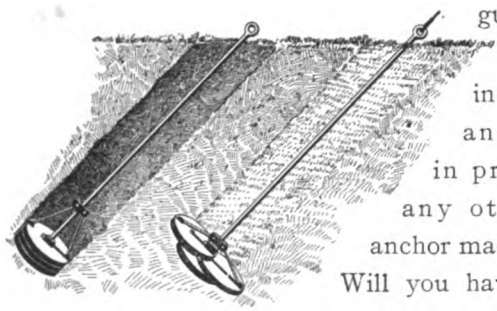


Factories: New Jersey, Pennsylvania, Ohio

Standard Vitrified Conduit Company

Main Offices: 39-41 CORTLANDT ST., NEW YORK, N. Y.

The "EVERSTICK"

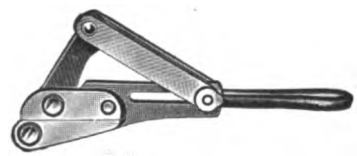


guy anchor is higher in efficiency and lower in price than any other guy anchor made. Will you have proof?

SPECIALTY SALES COMPANY
Cedar Rapids, Ia.

KLEIN'S NEW "CHICAGO GRIP"

is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.

TELEPHONE TROUBLES EVER TROUBLE YOU?

Your reputation as an inspector—ever come near losing it?
Do you know that our new book

Telephone Troubles, Their Location and Remedy

is designed to help you keep up the best of reputations?
And, too, if you're a beginner it will—if you study it—help you build an enviable reputation as a telephone inspector.

GET A COPY FOR FIFTY CENTS AND SEE

McGRAW PUBLISHING COMPANY, 239 W. 39 St., NEW YORK

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COMMERCIAL

OUR SPECIFICATIONS

A—Compound pours freely at 300 deg. Fahrenheit.
B—Compound exerts no corrosive action on bright copper at a temperature from 300 deg. F. to 350 deg. F.
C—Flashing point of compound 418 deg. F.
D—Burning " " 510 " F.
E—Compound shows no cold flow.
F—Compound loses practically nothing (.005%) after 24 hours at a temperature from 224 deg. F. to 245 deg. F.

Note high melting point, making it especially desirable for Southern climates.

Ask for prices on "Commercial Cable Compound." Made to above specifications—weighs 8 lbs. per gallon.

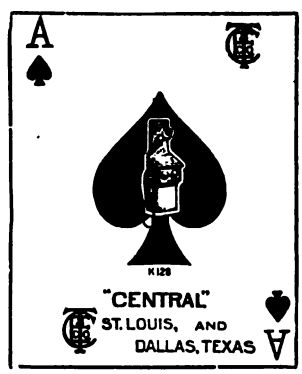
Commercial Electrical Supply Co.

ST. LOUIS, MO.

"THE" Supply House for Cable Construction Materials.

COMMERCIAL

The Ace High on Quality



The Deuce Low on Prices

1908 Apparatus and 1908 Prices

Central Telephone & Electric Company

ST. LOUIS **Everything Telephonic** **DALLAS**

Attach this advertisement to request of Telephone Company for prices—you get a pack of Shield Emblem Cards—we get the Orders.

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"Waiting Action of Bell Company"

That notation opposite several companies' names on our prospect list, spells inaction. It also calls to mind the Fable of the Tortoise and the Hare. Do you remember that the hare thought himself such a Live Proposition that after running part of the race, he could safely lie down and snooze till the Tortoise caught up to him and then beat the Slow Guy by a couple of hops? But he overslept and the Tortoise plodded by and won.

The Independent Company

that has made a part of the race and then deceives itself into the belief that it can lie dormant "waiting action of the Bell Company" is liable to wake up and find the race lost.

Just remember

that you can't afford to stop running in the race for business. Keep your plant at the top notch of efficiency all the time and don't wait to make improvements till your competitors force you to. Force them, don't let them force you.

Buy Automatic now

and keep ahead of your competitor. Don't wait to see what your competitor is going to do. Improve now and with Automatic.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Beaton, Minn.
Lansing, Mich.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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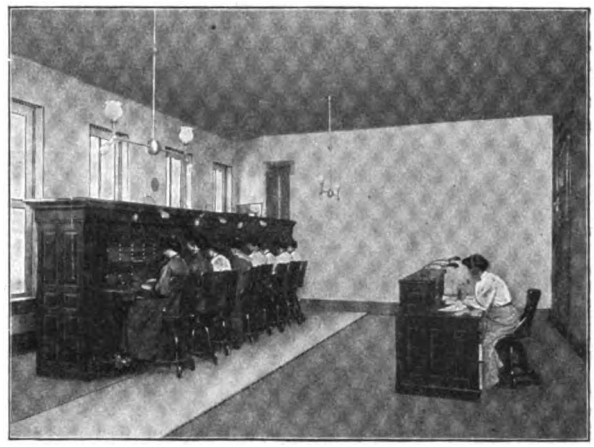

Dean C. B. Multiple Board at Mt. Vernon, Ohio

Manual vs. Mechanical

¶ **From the Subscriber's** standpoint, the most complete labor saving service is obtained with the best manual telephone exchange—the Dean Common Battery Multiple Switchboard.

¶ **The Mere Removal** of the receiver from the hook makes the call. Replacing the receiver insures immediate disconnection, in the most simple manner.

¶ **The Human Element**—the operator—is as necessary, and not as expensive, as the many trouble experts required to maintain any mechanical exchange.

¶ **The Poorest Operator,** with her continual application to simple duties on a Dean board, is at least on a par with the most careful subscriber who makes his own connections.

¶ **Expert Supervision** of telephone service is absolutely necessary—the best results cannot be obtained where the subscriber is his own operator.

¶ **The Average Service** on a Dean switchboard is therefore far superior to the best service obtained with any other system.

¶ **The Results** need no argument.

¶ **Labor Saving Devices** on Dean manual switchboards, make the work of connecting and disconnecting more positive, rapid and accurate than is possible with a mechanical or any other switchboard.

¶ **The Smallest Possible** number of switchboard parts, in proportion to the number of subscribers served, is what makes the cost of Dean exchange up-keep practically nothing.

¶ **This Is True** also of subscribers' apparatus. Simplicity of equipment is vital to good service and to economic maintenance. The high grade, superior design and expert construction of Dean apparatus has never been questioned.

¶ **Taking These Facts** into consideration, is it not reasonable to count on the most profitable return from investment in a Dean exchange?

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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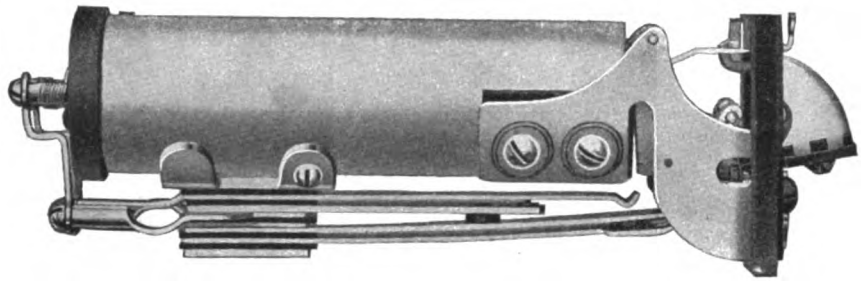
No. 8 SELF-RESTORING GRAVITY DROP

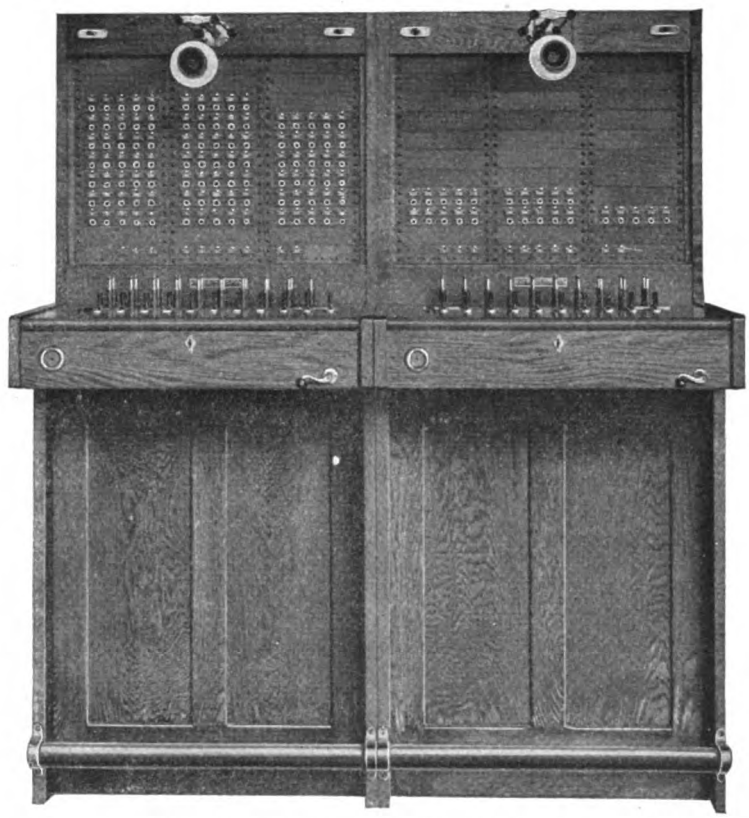


150-LINE MAGNETO SWITCHBOARD

TWO SECTIONS UNIT TYPE FOOT RAIL BRACKET

QUALITY WOODWORK

¶ The only switchboard cabinets that wear as well as they look. All made in our factory.



A-5360 Oak Switchboard Cabinet--Mission Finish.

QUALITY APPARATUS

¶ The kind of tool-made apparatus that lasts long after quality is forgotten.

To the Man-Who-Buys the real question is: "What KIND of service is this switchboard going to give me five years from now?"

Ask Yourself that, when you are selecting a magneto switchboard equipment.

Stromberg-Carlson Magneto Switchboards are recognized everywhere as the very HIGHEST TYPE of strong simple, clever construction, combined with most durable and lasting finish, PLUS the most efficient and economical Quality Apparatus that lasts.

Tell us your needs and get our prices

STROMBERG-CARLSON TEL. MFG. CO.

ROCHESTER, N.Y.-CHICAGO, ILL.

"ROBERTS" AND WHAT IT MEANS

8 The System's advantages include Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, etc., and adaptability to any existing local battery exchange.

Emergency Signal

The subscriber's signalling circuit is always available whether the line is busy or not. In case of an emergency, the line being busy, the operator's station may instantly be secured simply by raising and lowering the switch-hook a number of times, but, before answering, she will, as a mere matter of courtesy, ask the parties using the line to "hang up," though it doesn't make a particle of difference whether they do or not. She will immediately clear them off, anyway, and give the line to the subscriber who has the urgent need of it. Her power and control over the line and every instrument on it at all times is absolute, regardless of what any subscriber may do to prevent, short of tampering with the line wires.

What about it? Why not write for a complete description of the System?

HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago

ECONOMY

Does not always mean low first cost. There must be taken into consideration, efficiency—the cost of maintenance—and lasting qualities.

When all these are considered, a comparison with other apparatus will prove Monarch the most economical produced. The best material—excellence in design—careful workmanship, help us to make it so.

When you are in need of telephones, a private branch board, multiple exchange equipment, or an intercommunicating system, let us submit figures.

We will send you our catalogues upon request.

MONARCH TELEPHONE MANUFACTURING CO.

Factory and General Office:
Washington and Morgan Streets, CHICAGO, ILL.

Branch House:
177 Main Street, DALLAS, TEX.

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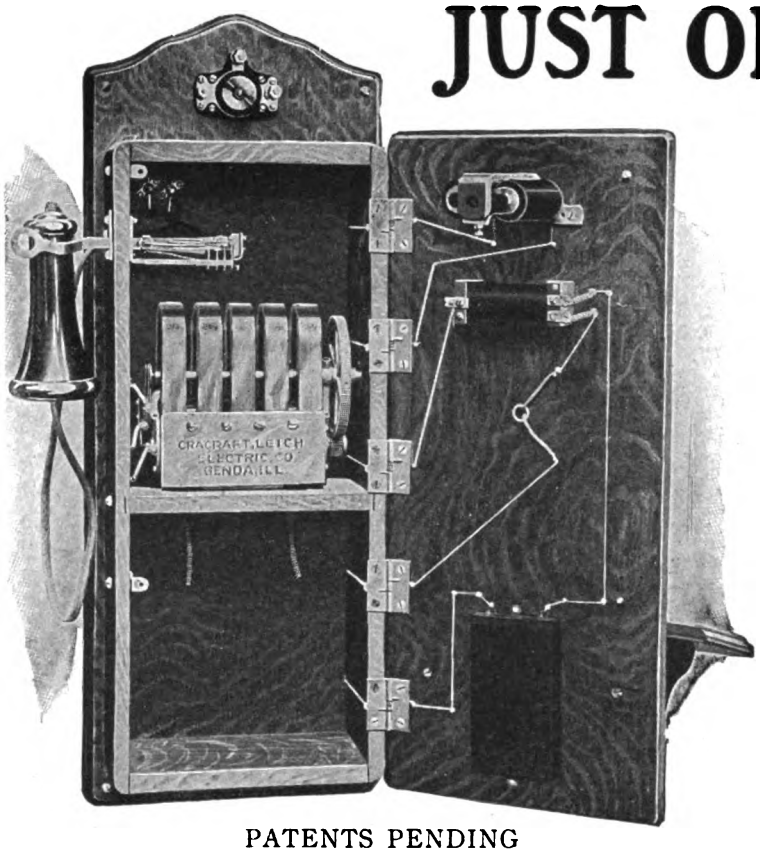
JUST ONE GLANCE



PATENTS PENDING

is *all* that is necessary to impart the character of this telephone—the arrangement of apparatus and wiring, which is *unique* and distinctive of **Cracraft Leich apparatus.**

Such *extraordinary* individuality is not based upon *one*, but a *number* of qualities.

Sound engineering thought and care have been spent upon *each individual part* of the apparatus composing the whole, making each part a unit of *high character* and the complete telephone a *standard* of excellence.

Only materials which experience has proven *best* for the particular work required are used. The tools and appliances employed in its construction are of the *latest design* in the art of modern manufacture. This insures a *uniform* and *well assembled* product and makes it possible to put this telephone upon the market at a *satisfactory price.*

SEND FOR FURTHER PARTICULARS AND PRICES

Cracraft Leich Electric Co.

GENOA, ILLINOIS

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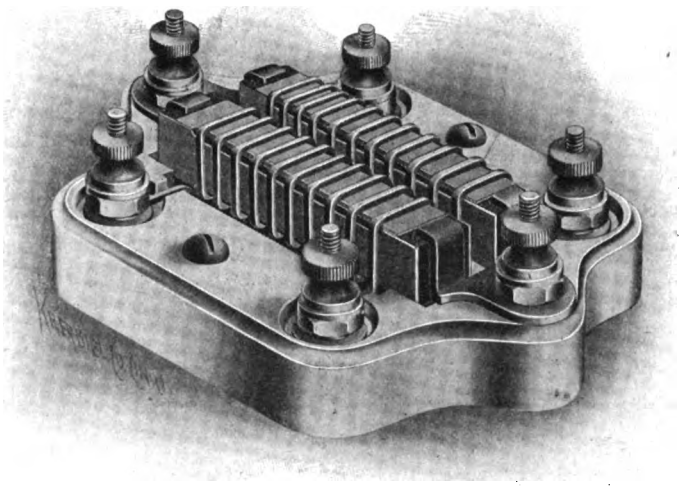
A Guaranteed Lightning Arrester



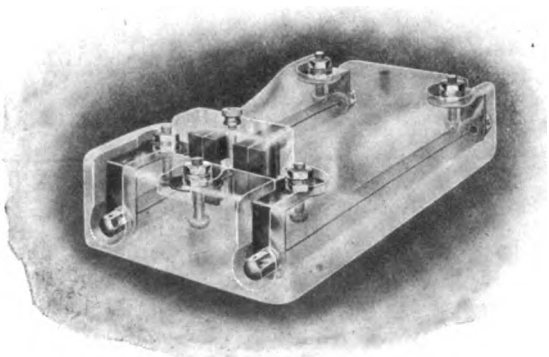
OUR PHONES, when equipped with our arrester, are guaranteed not to burn out for **one year** from date of purchase.

Write for our guarantee proposition and special prices on rural line phones.

THE SUMTER TELEPHONE MFG. CO.

SUMTER, S. C.

STERLING
GOOD GOODS



No. 258
APPROVED ARRESTER
MADE BY
STERLING ELECTRIC CO.
LA FAYETTE, IND.

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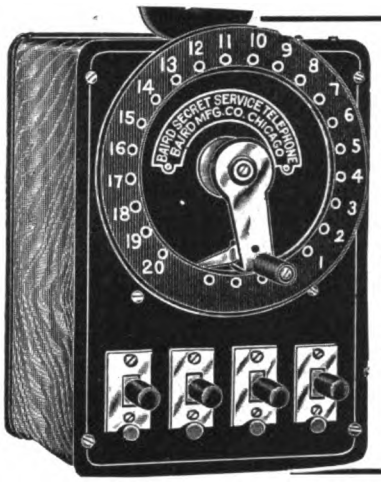


Operator's Calling Device

BAIRD PARTY-LINE
SECRET-SERVICE
TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

Write for Catalogue and Testimonials.

BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.

U. S. COMBINED

CASH REGISTER and PAY STATION

GIVE THE BEST SERVICE

Single Gong only — A Cash Ticket with every collection

NO ERRORS — CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.

We have on hand newly manufactured, guaranteed apparatus of all makes

Telephones, Switchboards and Supplies

which we can sell to you at a reduction of 40% to 50% in price. Write us to-day.

We rebuild all kinds of telephone apparatus. Make it as good as new. Consult our repair department.

Missouri Valley Telephone & Electrical Construction Co.

123-25 West 6th St., Kansas City, Mo.

ANDREWS STEEL ROD TELEPHONE

Operator's Revolving Chair

No. 78 M.

Steel Foot Rest—Seat and Back readily adjustable to occupant—Height of Chair easily regulated. Frame work made of Bessemer Steel, ⅜ (three-eighths) inch rods twisted and interwoven. Wood work, oak, birch or mahogany finish, as preferred. Metal work heavily plated, Japanese copper finish.

The Most Comfortable High Chair Made

The Most Attractive and Convenient

INDESTRUCTIBLE

Nothing to get broken

24-inch high 28-inch high

Warranted for 10 years. Send for complete Catalogue and Prices

The A. H. Andrews Co.

174-186 Wabash Ave. Chicago, U. S. A.

No. 75 M. Toll Board Chair.

Money Makes Its Own Signals

when dropped into the

GRAY TELEPHONE PAY STATION

No levers, cranks, buttons nor trouble. Just efficient service, with its consequent profits. Get Catalog 50.

GRAY TELEPHONE PAY STATION CO., Hartford, Conn.

Insulated Staples

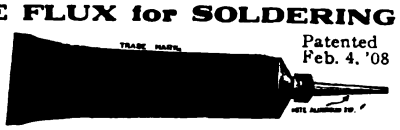
4 Sizes

Pat. Nov. 1900

BLAKE

TUBE FLUX for SOLDERING

Full Size of Tube, 1" x 5"



Patented Feb. 4, '08

COMPRESSED CLEATS — FOR USE ON PLASTERING

Exact Size — Pat. July, 1906

BLAKE SIGNAL & MFG. CO. — WRITE FOR SAMPLES — 246 SUMMER ST., BOSTON, MASS.

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The Fallacy of Summer Dullness

The advertiser in any line who meekly accepts the notion that summer is a time when everybody is taking a rest, and little money is being spent, and therefore stops advertising, makes the error of shaping his business policy by something that is largely a popular fallacy—not well grounded in fact.— ***Printers' Ink.***

THERE is no question about the men engaged in the telephone industry buying *now* just as much as they were last Spring or will be next Fall, and they are reading the JOURNAL now. This is the opportune time for the *progressive* firm to reach out for the business which the timid and over-economical advertiser will have no chance at. The business is there if you go for it.

AMERICAN TELEPHONE JOURNAL

239 West 39th St. NEW YORK

PREMIER STEEL CORD

Strength and Conductivity are both secured in Premier Steel Cord. The wire core A is made of specially manufactured steel wire—exceedingly strong yet flexible to a high degree. Good conductivity is secured by the copper winding B. Accidental breakage through hard or careless usage is further guarded against by a steel reinforcing spring inserted in the hollow at the plug end, where such breaks would otherwise probably occur. There's a triple layer of insulation over all. It's a good cord—the best there is. Want details?

Runzel-Lenz Electric Mfg. Co.

97-101 South Clinton Street, Chicago

Connecticut Automatic

Intercommunicating Telephones are fitted with a non-interfering trunk button which cuts in the exchange and disconnects the phone from the entire system, leaving no possible chance for interference. Catalog 10 describes it and our other instruments. Write for a copy.

Conn. Telephone & Electric Co., Inc.
Meriden, Conn

TELEPHONE EAR CUSHION Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the ear-drum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash! crash! noises. Made by

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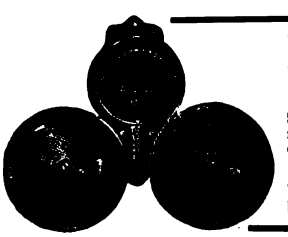

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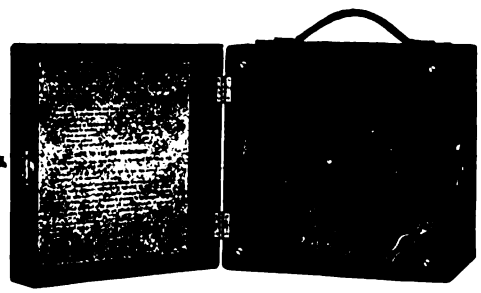

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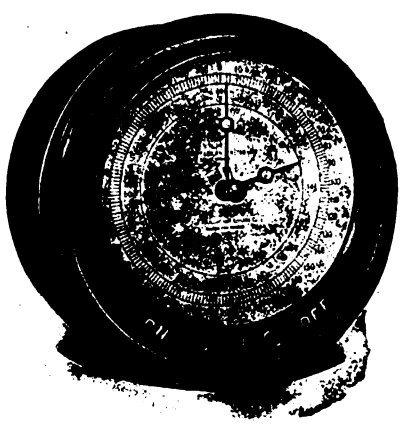

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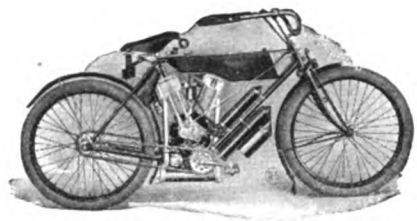

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

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Drug Store Unlimited Telephones Not for Public Use

The vexatious problem of the drug store flat rate telephone has been somewhat clarified by a decision just handed down at Seattle, Wash., in favor of the Independent Telephone Company. Swift's drug store refused to consent to the substitution of a coin-box pay station for its flat rate telephone, and after securing a temporary injunction to prevent disconnection of the flat rate line, lost its case. The Superior Court held that the company is not obliged, under its franchise, to furnish unlimited service for the free use of the public at the rate charged, and is justified in disconnecting the telephone of which such unauthorized use is made.

The circumstances which led to the trying of the case on which this decision was based seem to have been particularly burdensome to the telephone company. They constitute clear evidence of the injustice, not only to the company, but to the public, of allowing service free to all comers from an instrument located in a business establishment and maintained at a regular rate. One of the fundamental grounds for the decision is that, should the company allow one or more of its telephones to be used free of charge by the general public, it would be enforcing illegal discrimination against other subscribers.

The magnitude of the special favors which benefited the applicant for an injunction was clearly shown by traffic figures and estimates of the cost of furnishing service. The average number of calls per day from this station was 179.25, while the average calling rate per telephone per day for the entire system is reported to be 9.2, a normal figure for most exchanges.

While this is perhaps an exceptionally heavy ratio, the situation in respect to its general features is a most familiar one. Even within the few days since the decision at Seattle, a similar question has been carried to the courts in Nashville, where it is to be hoped that the telephone company will likewise be able to procure a favorable decision. In any event, the points on which the Seattle company won its case seem to be of general bearing, and the eminently fair and conclusive action of the court in this case will undoubtedly encourage managers all over the country to discontinue some of these contracts which represent so much work for so little compensation, and, instead, substitute pay stations which will provide additional revenue.

Buying Telephone Equipment on Specifications

In view of the multitude of supplies and spare parts needed in telephone work it is a question how far it pays the busy manager to prepare typewritten specifications when asking for bids upon new or additional apparatus. No doubt the process of specification writing is often burdensome to a busy engineer or superintendent, and when standard parts or supplies are wanted it is clearly a waste of time to go into much detail in stating just what are needed. If a certain latitude is desirable to allow a bidder to submit quotations upon new designs of material, it is

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only necessary to specify in the request for bids that the quality of the materials shall equal a certain standard, preferably that of a brand of supply material which has been found acceptable through the ultimate test of commercial service.

Certain kinds of equipment, however, need pretty careful selection, such as transmitters, receivers, wire, cable, poles, insulators, switchboards, lamps, operators' cords, plugs, jacks and batteries. Inasmuch as telephone work is not yet readily susceptible to the same exact measurements that obtain in central station practice, for example, it is not altogether an easy matter to specify such equipment by quantitative means. Poles and wire for line service are readily specified, the former on the basis of length, diameter, quality, point of delivery within a specified time, and the latter with respect to conductivity, tensile strength, torsional strength if desired, variation in size and manner of shipment. Recent investigations, notably those of Dr. J. T. Rood a year or so ago at Clark University, have shown that it is now possible, given the time and apparatus, to study the performance of the most delicate telephonic movements down to considerably less than the one-millionth part of an inch. It is no doubt beyond the scope of most Independent companies to pay for studies or tests of a very highly scientific nature in a laboratory of broad reputation, but the whole telephone world is the richer because of the development of precision measurements in connection with these elusive phenomena. We refer to such work simply to show how much remains to be solved in the physical problems of telephony, and how great is the incentive to study the performance of equipment under all possible conditions that arise in practice.

The more records are kept of the life of telephone apparatus under known conditions, the more readily will the telephone user be assured of getting just what he desires when he buys apparatus in the open market. To some managers it may seem like a small and narrow course to look into such points as the make-up of operators' answering cords and the life of relay contacts, pilot lamps, buzzer signals, jacks and keys. But the more one knows about the inner physical structure of telephone materials in service, the broader is the opportunity to eliminate poor designs, and to point the way toward improvements that will be for the benefit of the entire industry. Taken by themselves, many of the supplies used in the industry are not of the utmost financial importance, but in the aggregate they count heavily when it comes to the maintenance charges per year. The very fact that apparatus in individual pieces is duplicated thousands of times in a single system makes it worth while to always study the best qualities of material and to know something definite about the life and reliability of equipment, expressed not in general terms, but in figures.. The progressive electric railway company does not fail to study the operating conditions which surround the single passenger, for those conditions may be multiplied a hundred thousand fold in a single week. The complex machinery of a modern telephone system needs the same study in detail. Finally, the specification may be only 10 words long, but it will always serve as a live memorandum of material wanted at a certain definite time, and if supplemented later by the contract or purchase details, including date of delivery promised and actually obtained, cost in as much detail as was available, life and repairs noted in service, if practicable, the effort expended in the preparation will be well worth the results in rendering available accurate knowledge of the company's practice at stated periods.

Long Distance Revenue Division Problems

A typical inquiry from a company operating in territory not enjoying the advantages of an Independent clearing house is answered on another page. The explanation of the conditions which led to the asking of the question suggests rather clearly the existence of certain operating and business features which, in not a few sections of the country, have caused a practical approach to a deadlock in the development of long distance business. The worst evil is perhaps not the comparative stagnation of construction, and a slowing down of attention to operating requirements, but the fact that there have, in many instances, arisen certain local differences which have prevented the upbuilding between long distance companies and small organizations of a spirit of mutual interest and co-operation.

Among the chief reasons commonly assigned for the lack of progress in developing toll business in such territory are that the companies owning long distance lines find difficulties in obtaining satisfactory accounting and prompt settlement for messages originating with the local companies. Frequently, too, owing to poor construction or maintenance in the systems of the latter, communication is impossible, or so difficult as to impose an extra burden upon the lines and staff of the long distance company, thus giving the user an unjust impression of the character of the entire system. In such instances, the non-technical subscriber is unable to discriminate, and the local company too often guides him to the wrong conclusion by laying all the trouble at the door of its connecting associate.

As a result of these conditions, each party may consider that the toll business makes more trouble than it is worth, and settlement for messages is effected in a manner which is often admittedly haphazard and uneconomical. Neither party can figure the returns on improvements, and so fails to make them.

The clearing house plan has been in operation in several states long enough to show most valuable results. But, even where conditions do not warrant the establishment of a regular clearing house for effecting settlements between member companies, there is no reason why one of the chief benefits of its operation should not be secured by mutual agreement between connecting interests. Equitable division of toll earnings on the basis adopted in the clearing houses can be practiced even when outside assistance is absent. Once this is substituted for one of the various slipshop, arbitrary and unfair plans in vogue, both parties will begin to see why well managed and closely organized companies are so much interested in building up toll service, and call it the profitable end of the business.

The Rio Janeiro Police Signaling System

With all its skilfully designed signaling apparatus, we find that the very foundation, from an operating standpoint, of the police signaling system of Brazil's chief city, is the telephone. It is this instrument which supplies the final connecting link which determines action when the time comes for real work. Likewise the installation and maintenance of the system furnishes a problem which can be most easily handled by men with telephone experience. The technical features of a police signaling system are so closely related to those of the ordinary telephone exchange that, as time goes on, an increasing number of our telephone managers find it advantageous to consider their installation and maintenance for cities as a business proposition which can be worked out with advantage to both parties.

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The Police Communication System at Rio Janeiro, Brazil

By Dr. Alfred Gradenwitz.

The police signaling plant recently installed for the city of Rio Janeiro, Brazil, is considered by engineers in Europe, where it was designed, to be a model plant of its type, and presents many features of interest.

The city has in addition to the main police station six substations and a considerable number of minor posts. While the main and substations contain a number of officials corresponding to their size, those minor posts are manned by only a limited force, usually about six men. A light wagon provided for each post allows the whole of its staff to be quickly conveyed to the spot where their aid is required. The signaling plant described below is calculated to further increase the promptness of action of the police.

A number up to 15 special alarm boxes are electrically connected over the same conductors either to the main station or to one of the six substations, where the conductor terminates in a receiver. These receivers, as seen in Fig. 1, are arranged at the main station in a row on a table. Whenever an alarm is actuated by turning a key in its hole in a signal box, a bell signal will be given at the police station and a red incandescent lamp, installed on a small column beside the receiver, will be lighted, thus informing the operator from which line the signal has been received. The number of the alarm actuated appears on the paper tape of the recording apparatus, in the shape of an arrangement of dots exactly corresponding to the number visible on the outside of the alarm. A time stamp automatically prints the time of receipt on the top of this number. A signal thus recorded is represented in Fig. 3.

Now, as the main station at present is the receiving office for 14 such alarm lines, 14 receivers are provided on the table visible in Fig. 1, and the official whose attention has been called by the alarm and signaling lamp, after reading the number of the police alarm, immediately transmits this to the police post situated nearest to the alarm. This transmission is effected in the most simple manner by the large, round apparatus, a repeating clockwork, fitted in the middle panel of the right-hand switchboard (Fig. 1). It is adjusted to the number desired by the rotation of three hand wheels, and disengaged by turning over the crank situated below those three wheels. Signals to the corresponding station are transmitted over a metallic circuit.

Fig. 4 represents on a larger scale the repeating clockwork, on which the official is in a position to adjust for and to transmit any number between 1 and 999. Somewhat below this clockwork is fitted in the middle panel of the right-hand switchboard (Fig. 1) what is called the master switch, by the aid of which the line of the post to be called is connected to the repeating clockwork. By turning the small handles situated below the horizontal bridge, the official is in a position to call to the same number, several, or if desired, all the posts.

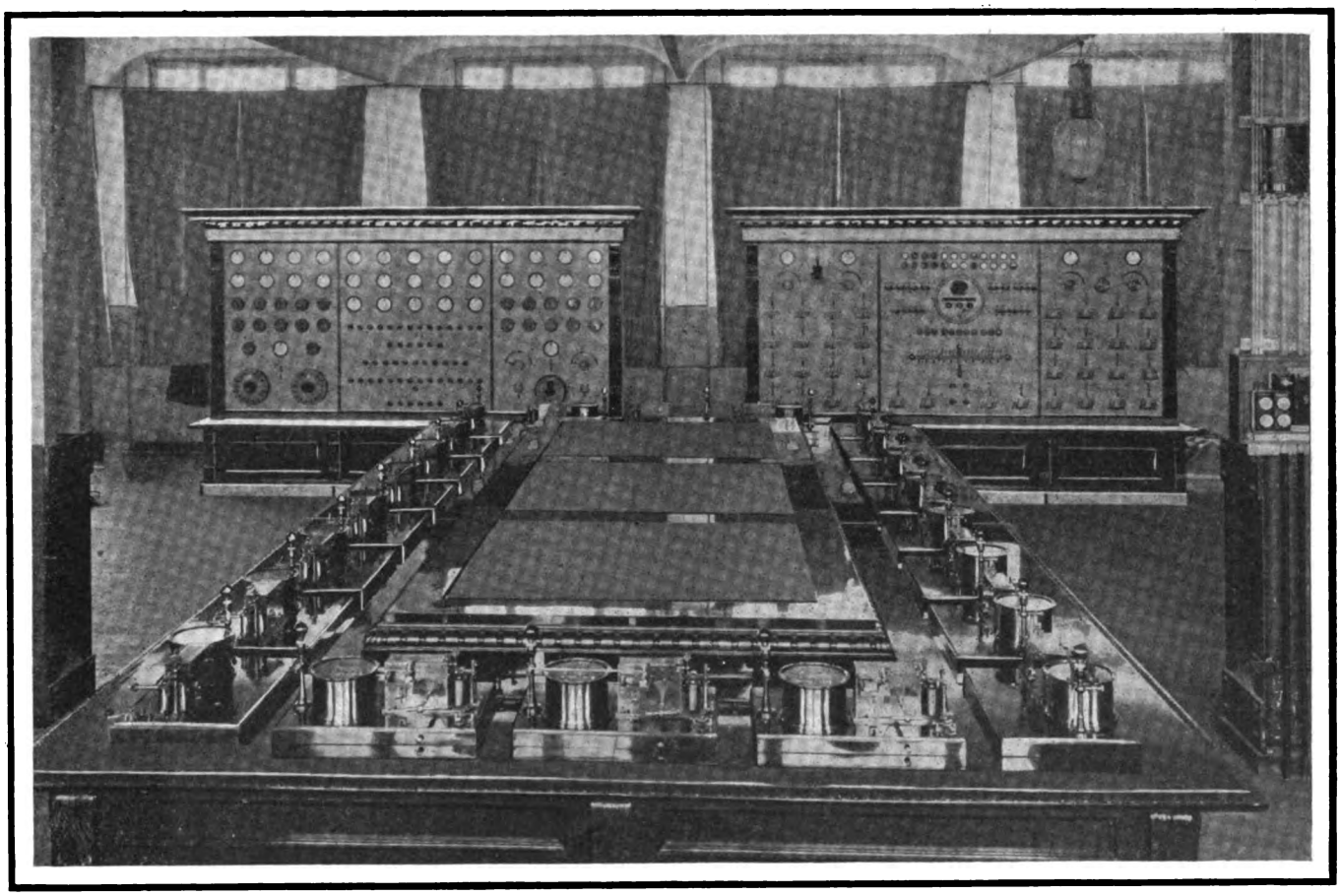

Fig. 1.—Controlling Switchboards and Signal Recording Apparatus at Headquarters.

In order to achieve this, all the switches are closed simultaneously by operating a large vertical lever, connected to a sliding bar attached to the switch arms. As signals, instead of being immediately transmitted from the alarm boxes, are given to the posts through the intermediary of a police station, the latter is in a position to call up any post, which is the more important, as the one situated nearest to the alarm may have been called up by another party. While the working of the alarm in the case of an immediate transmission would be of no avail, the police station in the present case is kept permanently advised as to which posts are engaged or disengaged, thus being able at

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any time to yield efficient help in cases of unexpected trouble.

An aggregate of about 580 police alarm boxes are installed at convenient places throughout the city, either on the walls of houses or isolated. Fig. 2 shows the outside appearance and internal arrangement of these boxes. In order to enable each citizen to call police aid at a moment's notice a keyhole is provided

Fig. 2.—Views of Call Box, Showing Exterior, and Calling Apparatus.

in the middle of the door, and numbered keys are delivered to the inhabitants of the Brazilian capital. A special register containing the names and numbers of each citizen provided with such a key, as well as the number of the latter, is kept at the police station, thus allowing the owner of each key to be ascertained at any moment. In fact, after actuating the alarm by turning the key round in its hole, the key is held and cannot be removed by its owner. The police alone will be able to disengage the key and restore it to its owner.

The apparatus used in calling up the police stations and recording any signals that arrive at the police posts is represented in Fig. 5. The apparatus seen to the left of the figure is equipped with a special mechanism, causing the number recorded by the repeating clockwork to appear on the apparatus in plain figures. If, for example, the number 245 having been adjusted for at the repeating clockwork, the latter be disengaged by turning the crank, the same number will be adjusted for in this numbering apparatus at a moment's notice. The contacts in the repeating clockwork are so arranged that the first roller will at first be adjusted to 2, after that the second roller to 4 and finally the

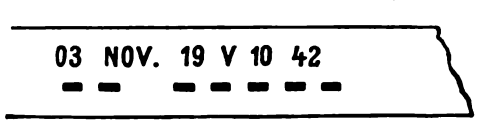

Fig. 3.—Sample Record of Call on Tape.

third roller to 5, so as to cause the whole figure to appear, while the staff of the post is at the same time informed of this number by loud bell strokes given out by an alarm visible below the apparatus. Those bell strokes are separated by intervals sufficient to ensure the audibility of the figure. The latter at the same time is recorded in a recording apparatus fixed on a wall bracket, in the shape of dots constituting the various numerals. A time stamp is associated with this mechanism. A clock with an electrical pendulum installed on the top of the bracket causes the time stamp to be moved on.

The whole signaling process, from the moment the alarm is disengaged until the post is called up, is performed in a few seconds (15 to 20 as a maximum), so that whenever an appeal for help is sent out the nearest post will be informed within a minimum of time, so as to be able to send men to the spot. When the policemen arrive at the alarm that has been actuated they will be in a position, after opening the outer door of the apparatus (by the aid of a special key), to disengage the user's key, left in the keyhole. Should the police force available not be sufficient to yield the help required, as in the case of some serious disturbance, they will further be able, by adjusting an index to a scale provided in the interior of the alarm, to transmit to the police station another signal, which is received by the same apparatus as the first appeal, being distinguished from the former only by an additional mark. If, for example, the index be moved to the third panel, marked "Ambulanzia," the receiver, in addition to the number of the alarm, will give out two striking dots, and this signal would impel the superintendent to immediately adjust the repeating clockwork to the number of the alarm, and to turn over at the master switch the lever connecting to the central station.

The central station, which is equipped with receivers resembling those of a police post, is called in a manner quite similar to the latter. Unless special information is received by telephone help will be sent out in the usual manner.

The whole of this plant further serves to check the police officials themselves. Each policeman while out patrolling is instructed to open the alarms belonging to his district, and after adjusting the index above mentioned in the interior of the apparatus to the fifth panel (marked "rondante"), to again disengage the alarm by turning over the upper crank. After then closing the apparatus the man proceeds on his rounds. By closing the alarm, the index is readjusted automatically to the first of the seven panels. The policeman, apart from the operation of the telephone, will not carry out any manipulations in addition to those above described.

This checking signal will cause the number of the alarm to be registered in the receiver of the line. Care has, however, been taken for the checking signals not to disengage the alarm of

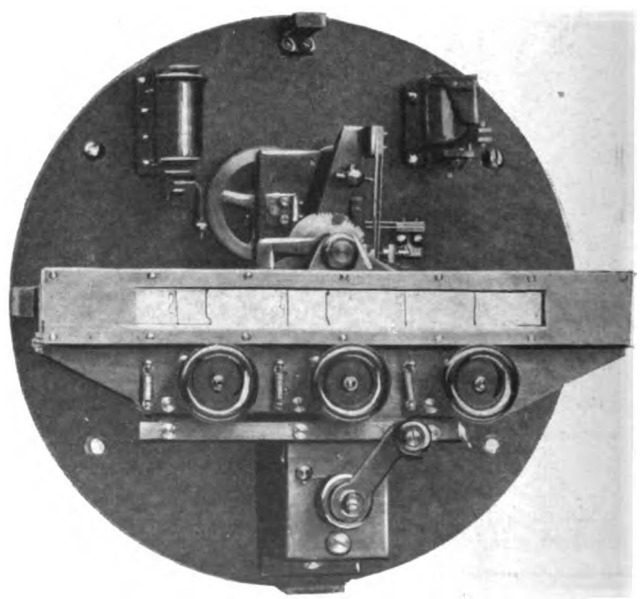

Fig. 4.—Repeating Clockwork, for Calling Substations.

the police station; nor is the signaling lamp of the receiver lighted permanently, as in the case of an appeal for help, being only lighted periodically according to the making of contacts from the alarm, and being extinguished as soon as the number of the latter has been recorded. Those signals are, obviously, likewise provided with a time stamp. Similar checking signals are given out by sergeants as well as by officers on their respective rounds, special panels being provided for each of the

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three types. The signals received are then distinguished by a mark in addition to the number of the alarm.

A master clock installed at the main station, apart from actuating all the 21 time stamps provided at this station, keeps up the synchronism of all the clocks used at the police posts for a similar purpose. This master clock is connected up to a single line, traversing all the posts of the city, and the clock at each of the posts and substations is provided with a relay causing the contact given out from the master clock to effect their permanent regulation. An absolute equality of time is thus ensured throughout the police stations of the city, which is of the utmost importance, with a view to the time stamps recording the moment a signal is received.

Though cables have been used throughout this plant, special measuring and checking devices, as used in connection with fire alarms, designed on the Siemens system, are provided for permanently and safely indicating the condition of those conductors. The switchboard represented at the left of Fig. 1, at the main police station, is equipped with a number of measuring instruments (milli-ammeters) corresponding to the number of lines. Below each instrument is shown the number or designation of the line with which it is associated. On the left-hand panel at the bottom there are installed two special rotating switches, and on the top another measuring instrument. This system of apparatus ensures an absolute safety in regard to any ground connections, while the instrument placed on the right-hand panel at the bottom, in conjunction with the three upper rows of switches located in the central panel, allows any defect of the line to be readily located.

The relays installed on the right and left-hand panels below the two rows of measuring instruments serve to effect an alarm on the receipt of an appeal for help and to prevent an alarm on the receipt of a checking signal.

No breakage of conductors is apt to interfere with operation,

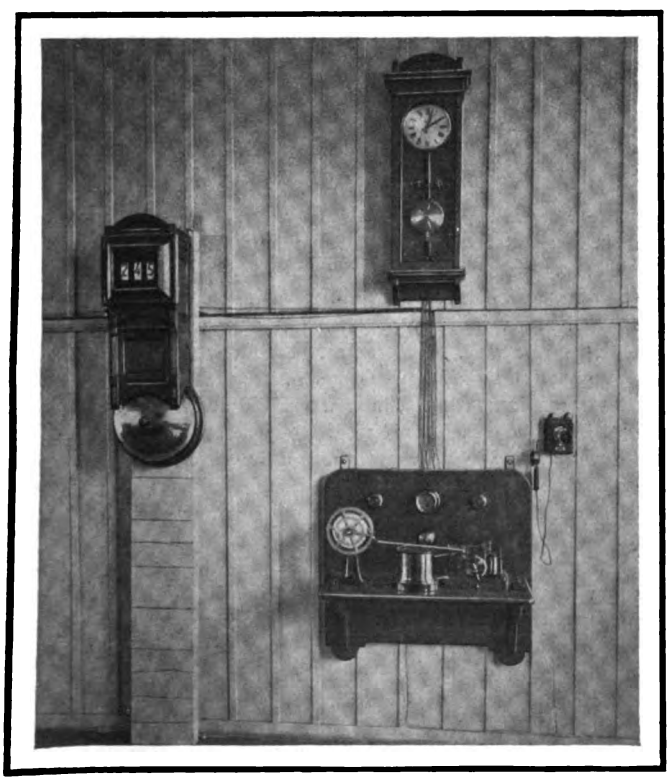

Fig. 5.—Apparatus at Posts for Receiving and Recording Calls.

either in the alarm lines or in those connecting the main station to the substations and posts. The receiver table, in fact, comprises a reserve apparatus, which is readily connected to any alarm line by turning over a switch (fourth row in the central panel, left-hand board, Fig. 1.) This causes any signal from an interrupted line to be received either at the receiver of that line or at the reserve apparatus. In the case of a breakage in the connecting lines, the ground is used as return.

The recording instruments which, being provided with a style drum, have to be wound up from time to time, are provided with a contact, closed on the spring being wound off and which actuates a bell, while the number of the apparatus to be wound up appears on one of the white panels visible in the right-hand switchboard (Fig. 1) above the repeating clockwork, thus safely signaling the fact. All the manipulations connected with the operation of the station are checked in a similar manner, being

Fig. 6.—Switchboard for Telephone Lines, Arranged for Communication with City Exchanges.

indicated in addition to the apparatus numbers on one of the switchboard panels. To the right and left of the main switchboard panel are installed the switches and apparatus used in charging the accumulators. Beside the repeating clockwork there are found two rows of switches, by the aid of which any policeman can be called up while out patrolling. Above each alarm there is arranged an alarm bell and an incandescent lamp with green globe. By turning over upwards or downwards the switches above mentioned, the alarm bell (by day) or incandescent lamp (by night) of the line is thrown into circuit, thus enabling any policemen or sentinels to be called to the next alarm with a view to receiving orders by telephone.

The telephone plant, arranged on the central battery system with incandescent lamp calling, is a valuable addition to the signaling plant. The switchboard is represented in Fig. 6 and, as seen from the figures, each police post, as well as each alarm, is provided with a telephone. The substations, as well as each room of the main station, are obviously likewise equipped with telephones. The telephone switchboard is designed for being operated by two men in the case of lively service. The calling lamps are located in the small vertical central panel, their color corresponding to the kind of lines concerned. There are 14 alarm lines terminating at the main station, in addition to the 6 substations and 11 posts, and 4 lines with their switches for connection to the municipal telephone system. The remaining lamps are used for local connections.

The task of installing this telephone plant in the conductor system of the signaling plant was made somewhat difficult by the telegraphic signals having to be transmitted over the same lines as used in talking, unless the amount of conductors be augmented considerably. Another condition is that officials be unable to overhear any conversations carried on between the different police stations. Those conditions are complied with perfectly.

The switchboard is called by lifting the receiver located in the police alarm, when the lamp corresponding to the line in question will be lighted. This signal can be completed by an audible signal after a small hand switch has been turned over.

The completeness of this system, together with its simplicity and reliability due to the arrangements for interchecking, as well as general high character of design and workmanship, are considered to reflect much credit upon the firm of Siemens & Halske, of Berlin, who designed and installed it.

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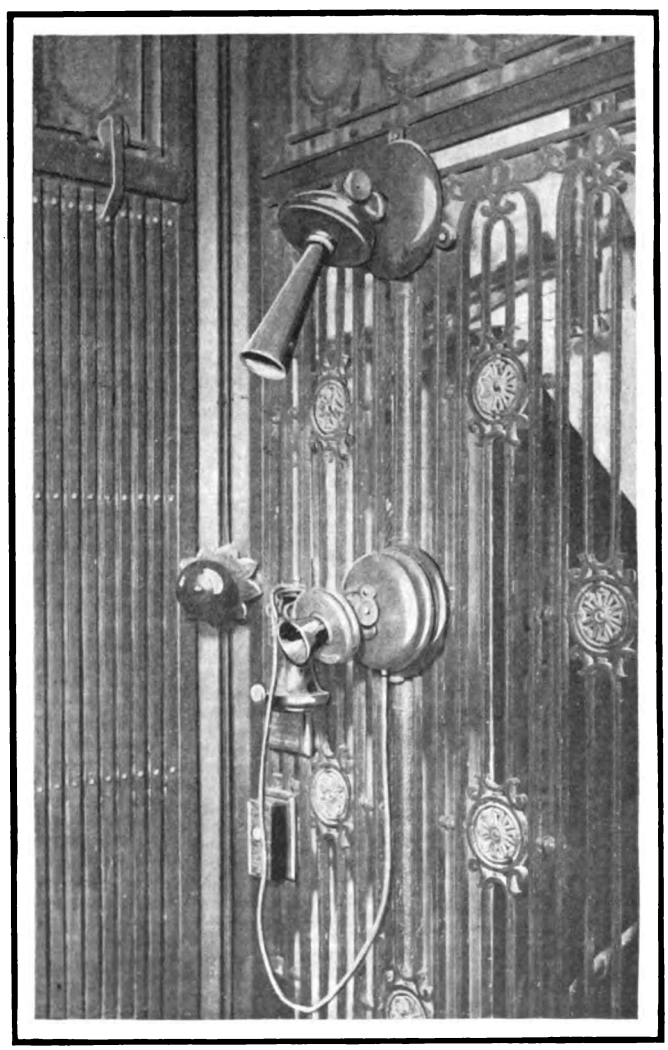
Telephone Control of Highest-Running Elevators

In a number of cases telephones have been installed in elevator cars to enable the car operators in cases of emergency, to talk with the engineer in the basement. However, in the Singer Building, in New York City, is the first installation of a complete telephone system especially designed for elevator operation. This building, which stands at the corner of Broadway and Liberty Street, is 612 ft. high and contains 47 stories. Until the Metropolitan Life Insurance Building shall be completed this building holds the distinction of being the highest office building in the world. When it is realized that, if the building were laid down parallel to Broadway, it would extend three blocks, it can be readily seen that the telephone can be made of great use in the operation of the elevators.

When the construction of the building was first planned, the engineers started work upon a system for operating the elevators by means of the telephone, and the system installed as a result of three years' study is highly satisfactory. In fact, when a water pipe burst recently and the telephone cables were exposed to the moisture, rendering the system inoperative, it was demonstrated that it was impossible to satisfactorily operate the

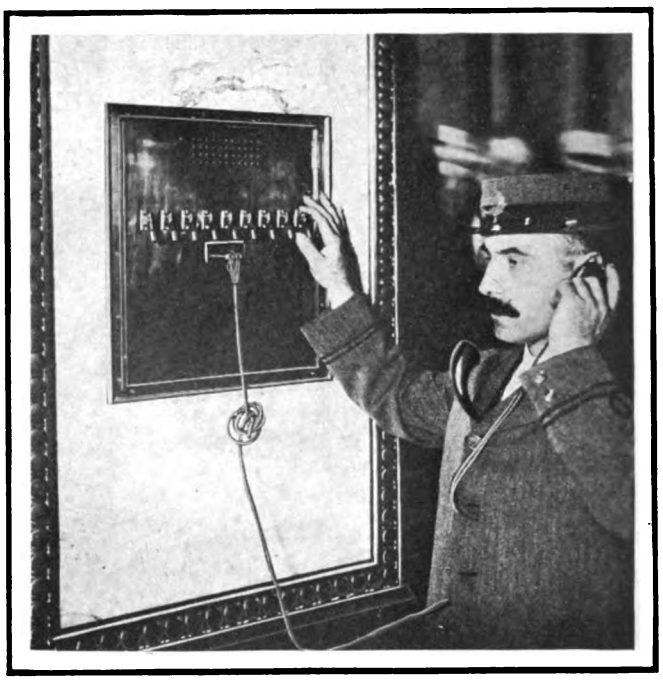


The Telephone Equipment of the Elevators in the Singer Building. The Upper Instrument is the Loud Speaking Receiver.

elevator cars without the use of the telephone. The necessity for some adequate system of central control is made clear by figures on the traffic and travel of the cars.

Sixteen elevators are grouped in three sections in the building, and these are operated to the various floors in different parts of the building. Express elevator cars in the tower portion of the building travel at the rate of 600 ft. per minute, and each will carry 18 persons. With the building fairly well filled with tenants, the cars will travel about 310 miles daily, making a yearly total of 98,270 miles, or about four times the distance around the world.

The center of the telephone system is located in the chief engineer's office in the basement. Here is installed a small private



The Car Starter Giving Orders to One of the Elevator Operators While Car is in Motion.

exchange supplied with current by a 24-volt storage battery which is charged from the lighting mains. Ringing current is obtained from an interrupter operated by this battery. The switchboard, which is of the desk type, is equipped with visual signals and has a capacity of 50 line circuits and five cord circuits. Upon the wall, by the side of the switchboard, is a large wooden panel containing numerous switchboard lamps covered with opalescent lamp caps. These lamps are arranged in vertical rows, one row being assigned to each elevator, and in horizontal rows designating the floors of the building. On the sides are also lamps which indicate when the circuit breaker for any elevator is operated. Other lamps are used to designate the position of workmen who have charge of the elevator equipment on certain floors, the lamp in the panel for the floor on which the workman is engaged being illuminated when he is on duty there. By means of this panel the position of any car may be ascertained at a glance, as the lamps are illuminated and extinguished successively as the cars pass each floor in making a trip. For instance, as car 10 starts from the ground floor and passes the second floor the lamp for that floor is illuminated, and when the car passes, it becomes dark and the lamp designating the third floor is illuminated, and so on, up the entire line of lamps. If a car stops at a floor the lamp remains illuminated until it starts, and if for any reason the stop is unusually long, the telephone operator can ascertain the reason by calling up the car operator.

Each elevator car is equipped with an ordinary telephone set. A small metal case containing the transmitter and receiver is mounted upon the side of the car, and the ringer, condenser and induction coil are placed in a box mounted near the floor of the car. In addition to this set there is also an instrument known as

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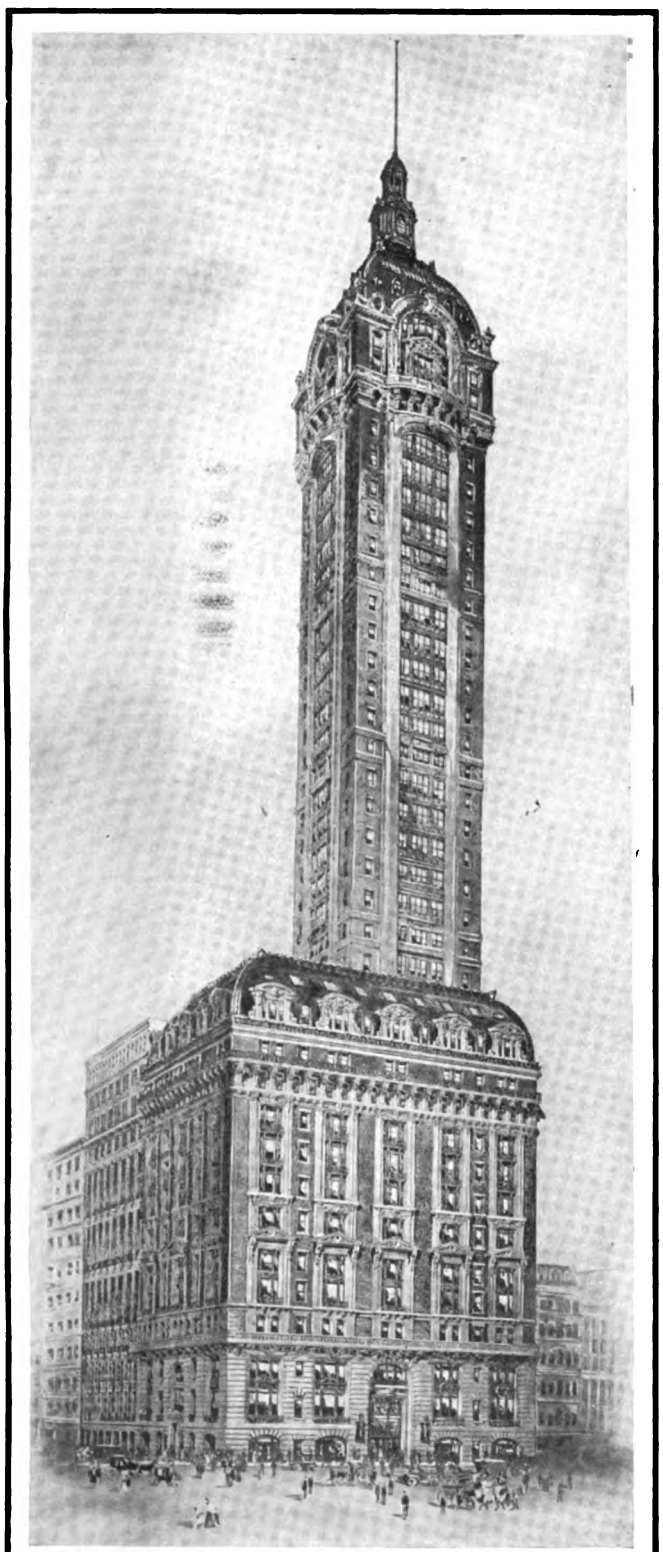
a loud-speaking receiver mounted above the wall set. These receivers were especially designed for use in elevator cars, and although each contains the same elements which make up the ordinary bi-polar receiver, these elements have been modified to secure unusually loud and clear enunciation. The diaphragm has a comparatively large diameter, and is fastened so as to be



The Singer Building, New York City, the First Office Building to Have a Telephone System Installed Exclusively for Elevator Operation.

free from strain. Instead of an earpiece, a horn or megaphone attachment is placed on the receiver and the whole is clamped to the base of the set so that when mounted in the car it can be adjusted in a vertical plane. By this means the car operator is enabled to hear orders given by the starter after the car has been set in motion without placing the receiver to his ear or interrupting in the least his work of operating the car.

The elevator starter handling each of the three groups of cars is within convenient reach of a small metal panel mounted either upon one of the marble columns in the hallway or upon the wall. A call bell is also mounted upon the panel for signaling to the starter when a call for him comes to the switchboard. For connecting with the cars, the panel is equipped with a series of switches, the handles of which project through the panel, as shown in the illustration. The switches enable the starter to connect directly with the loud-speaking receiver in any car desired. The starter can give orders to the elevator operator through the loud-speaking receiver, but the operator is unable to talk to the starter. In case the operator desires to talk with the starter he can do so by obtaining a connection through the telephone switchboard in the basement. The starter's telephone set is of the portable type comprising a watch-case receiver and a breast transmitter, such as is used by telephone operators. These are connected by flexible wire cords to a twin plug which is carried by the starter in his pocket and inserted into either one of two sets of jacks in the panel, depending upon whether he wishes to talk to the car operators or through the private branch exchange switchboard to the engineer or someone else. The flexible connection of the starter's telephone set enables him to face in any direction and give information to those inquiring about the cars. A lamp panel, similar to the one in the chief engineer's department, indicates the position of the various elevators.

By means of the telephone set in the cars, the car operator can promptly report any trouble or other matters which need attention. For instance, if he finds that the doors on floor 36 do not work properly, he advises the telephone switchboard operator, who makes note of the trouble and then glances at the lamp panel to find the whereabouts of the workman who looks after the trouble on the thirty-sixth floor. The workman is then called up by telephone and directed to take care of the trouble, and in less than three minutes the lamp panel indicates that the workman is on the thirty-sixth floor looking after the trouble. This illustrates how quickly trouble can be attended to by means of the telephone when by ordinary messenger service it would take a much longer time. In all large office buildings occasions arise when it is desirable to get all the elevators to a certain floor as soon as possible, and this is provided for by special signals to the switchboard. For instance, if an accident should occur on the mezzanine floor, the watchman on that floor would press the emergency button, which would cause the emergency signal for that floor to be displayed at the switchboard. The operator would at once plug in on all the jacks connected to the elevator cars in that section of the building and tell the operators to run immediately to the mezzanine floor.

If a car operator should be suddenly taken sick, or feel that he was about to faint, to obtain aid he would only have to remove the receiver from his telephone set. The telephone operator would then send aid to him at once, as he could from the lamp panel tell exactly the position of the car.

From this description it is seen that the telephone operator is in constant touch with the car operators, and can find out immediately if there is anything wrong with the cars or the operators.

As mentioned before, this is the first instance where a telephone system is used for the operation of elevators, but, from the success attained, it is not improbable that many of the new large buildings will be equipped in a similar manner.

A Talk on Features of Rural Line Operation

Delegates to the Illinois Independent Telephone Convention found the brief talk given by Mr. Geo. B. Spitler, of Mt. Zion, to be a sure cure for the blues; in fact, few papers presented at conventions have such mirth-provoking qualities as this. And it seems to be "founded on facts," too. About taking contracts, he says:

"In building new territory, plan for a telephone in every

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house. They will not all want telephones; some positively have no use for them. I never like to put a telephone where there is no use for it; that makes so much work for the operators. But before long a man will come in as unconcernedly as a Chicago policeman offers information, and says his wife wants a telephone right away—and she does. Of course, he still insists they won't use it much, but we put it in. In a few days his wife rushes into the office like a house afire and wants to use the telephone; she calls out home, hears three or four babies crying, a hen or two cackling, and before her husband has time to say more than 'Hello,' she tells him to take good care of the baby, that there is a hen's nest in baby's buggy on the back porch and not put him in it; don't let the chickens scratch up the sweet peas; see if I left the cat shut up in the summer kitchen, and look out for Riley's dog, it was over there yesterday and broke up a duck's nest down by the branch, and don't forget if it looks like rain to bring in the clothes, and sow some lettuce seed and take the children's overshoes and the umbrella to the school house, and have the gate open for me when I get home. According to our contract the rent is payable quarterly. In about three months the man comes in again, pays up, and acknowledges the telephone is a mighty handy thing, and does not see how they got along without it, and orders one for his son's house. We have never done any soliciting."

Concerning service, the following is in line with the experience of many who have come to appreciate the value of good work:

"Service is generally good or bad, according to methods of construction. We cannot expect satisfactory service with poor circuits, and if any portion of a 'built up' circuit is defective it will discredit all the lines so connected, and patrons will condemn all when probably a very small portion is at fault, possibly only a battery. Certain battery conditions are the source of much annoyance. Good service must not be expected with exhausted batteries, and so they should be closely watched. On our system we keep a record of each installation, and should our troubleman be in the neighborhood of a battery likely to be run down, a fresh one is put in that telephone. This may seem a little initial trouble, but it is more economical to prevent trouble at your leisure than to repair it in a rush. One might just as well have a mile of line out as to have no battery. Keep up your battery and you will be surprised at the result. In the present progressive stage of the telephone business and the prosperous condition of the country districts, good service is imperative, and we should build and maintain with this object in view. This is a sound proposition."

The following will apply to a great many localities:

"The people are with us, and in most cases are willing to pay for what they get, but want fair treatment as well as good service. It is true that in a few instances they want something for nothing, and there are bargain shoppers among subscribers as everywhere else, but by a little education a good deal of this clamor may be eradicated. As a rule, I believe mutual companies are a detriment to the telephone business, for the reason that they are seldom managed in a businesslike manner, and by no one in particular. In theory it may sound all right, but sometimes they are organized by dissatisfied subscribers, and after the organization they are more discontented than before. Several years ago, a sort of mutual company was organized in our territory; stock sold for one hundred dollars per share. A few years later this stock sold for ten dollars per share, in order to avoid a sheriff's sale, and a streak of rust suspended on oak poles went with it. Many well-meaning individuals regard the other fellow's business as all profit, losing sight of the expense account, and the more proficient he becomes in his line, the easier and more fascinating it appears to others, and they want to get right into it. There are not six boys twelve years old in this city, when they are watching a baseball game, but think they could get their feet on the 'slab' and strike out every man on the 'Cub's' team in three minutes. For the men who play this is business, the other is imagination. The former is a trifle more difficult to handle, perhaps, but it brings better results. On our system we do not give free service between our four exchanges. We cannot afford to do so. There is just about as much reason in your grocer donating a ham when you buy a sack of flour as in a telephone man donating fifty cents to get half a dollar; the policies are the same and will expire about the same time."

A Case for an Up-Stairs Extension

A stout, elderly citizen of Toronto was alone in his house one evening reading in his den in the third story, when he heard the bell of his telephone on the ground floor ring merrily. There was nothing for it, but he must go down and answer the call, says a reporter for the *Toronto Saturday Night*, as it might be important.

But it was not. It was a young woman speaking, and she had got the wrong number. The stout, elderly gentleman was not pleased, and he said so very plainly.

"You've brought me down two flights of stairs," he said. "You've brought me down two flights of stairs for nothing. Now I've got to climb up there again. You should be more careful—get the right number before you call anybody up. People are altogether too careless. To a man weighing nearly two hundred and fifty pounds, climbing up and down stairs is no joke. I'll ring off."

"I'm very sorry," came the voice of the young lady over the telephone.

"You ought to be—you ought to be," he replied; and back up the two flights of stairs he clambered heavily, conscious that he had done his duty.

No sooner had he got comfortably settled at his book again, however, than the telephone rang again. He glared. But that did not help any. Still the bell rang its imperative demand. Down he went again, and to his surprise he again heard the young woman's voice.

"Excuse me," came her apology, "but are you the gentleman to whom I was speaking a moment ago?"

He was.

"Well, I have been thinking over what you said to me, and an idea occurred to me which I thought I should mention to you. If you weigh nearly two hundred and fifty pounds, perhaps going up and down stairs a few times would really do you good—don't you think!"

Then she rang off and left him standing there, alone in that great house, without a living soul to hear a word that he said.

To Study Southern Forests

An important step in the general movement to bring many of the rich stands of timber in the South under a scientific plan of forest management is the offer made by the School of Forestry of the University of Georgia at Athens, Ga., to furnish timber owners experts who will examine and report upon any of the forests in the state.

The object of the offer is to collect information in regard to the forest resources of the state, to spread a knowledge of forestry and to improve forest conditions. The forest school will furnish the experts free, and the only expense which will be borne by the forest owner will be paid for the traveling and subsistence expenses of the expert while making the examination. In cases where several owners of the same locality apply the expenses will be prorated.

When applications for examination are made the owners have been asked to give their names and post office addresses, location of tract, area of tract, character of forest as shown by the kinds of trees growing on the land, the conditions of the forest, whether mature, original or second growth, whether the land has been burned or cut over, and the wishes of the owner regarding the use of the land.

The necessity for intelligent management of forests is rapidly becoming apparent, and it is believed that under this plan much progress will be made toward the preservation and development of the forests in the South.

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The Los Angeles Social Secretary Experiment

By F. W. Rea.

The question of securing competent operators is one that has given managers of telephone companies a great amount of trouble and no doubt will continue to do so, so long as it is necessary to have operators. Their retention is a still harder task.

When the question, "Which would you prefer to be, a saleslady or telephone operator?" is put to a young woman who has had no experience at a switchboard, the invariable answer is "a saleslady." But ask the same thing of one who can boast of experience along both lines, and a different answer is received. Try it and see if it is not true.

The idea of "operating" seems to frighten the average girl and in some cases she has just cause for alarm. It is practically an impossibility to avoid the annoyances caused by a fickle public or a subscriber with real or fancied grievances. To "jump all over" the operator, figuratively speaking, is the first aim of an angry person at the far end of the line and it does not require many repetitions in the course of a day to put the operator's nerves on edge. She is then likely to begin thinking of securing another position, and to avoid a step of this kind it behooves the company to make her feel that her work is appreciated at one end of the line, at least. Girls are human beings, and a wise manager will keep that fact well in mind.

The Home Telephone & Telegraph Company, of Los Angeles, Cal., works on the plan that good operators mean good service. With good service the rest is comparatively easy.

This company has approximately 30,000 telephones in operation, of which about one-half are automatic and one-half manual instruments. It employs about 250 operators, who work in three shifts of eight hours each. To keep that number of competent operators is no small task, yet the company is having very good success in the undertaking. It is a little over three years since the company began giving service, but a canvass among the operators showed 36 who have been in its employ over one year, and 50 more whose service has extended over a period greater than two years. This fact, in itself, is a proof of their success.

In addition to physical ailments, young women are often mentally ill. This can be traced to various sources. If a girl's surroundings outside the exchange are not all they should be, it is a foregone conclusion that her work at the board will not be up to a proper standard. To meet such a condition, the company secured the services of a young lady with considerable experience in social and religious work among girls. Her duty is to mingle with the operators while off duty, and do all in her power to interest them and keep their minds at ease. The City Library Board, at the request of the company, opened a branch library in one of the rest-rooms, and the young lady, whose title is "Co-operative Secretary," was placed in charge with instructions to keep a supply of up-to-date books on hand continually. In addition to the books, the rooms are well supplied with current issues of those magazines and periodicals which cater and appeal to the gentler sex. The secretary, through obtaining the confidence of the operators, has been the medium of improving outside conditions to a certain extent. She does not play the part of a detective, but goes about her work openly and the girls are fully cognizant of her actions. If an operator is kept from work two or three days on account of sickness, the secretary calls at her home to cheer her up and offer her help, if needed. If any have errands or business which must be attended to during working hours and the business or errand is of such a nature that it can be entrusted to a third party, the secretary is there to oblige the operator.

To make a success of such a position, the occupant must be tactful and able to secure the confidence of the girls. In one instance, through obtaining this confidence she discovered a story of neglect and abuse. The girl had no mother and a shiftless father forced her to give him all her earnings—he met her at the office and secured her pay-check—and left her to provide clothing, etc., with the little money he chose to give her. Her home surroundings were debasing. A show of legal power was necessary before the father consented to treat his daughter properly, but it succeeded, and a good operator was saved. The credit was due to the secretary who, while she did not carry the case to a finish, was the means of starting it.

The secretary organized a gymnasium club among the girls, named it the H. T. C. Gymnasium Club, and secured the use of the gymnasium in the local Y. M. C. A. The value to the operators of such exercise is apparent. Before the advent of the secretary few, if any, of the girls took interest in athletics or outdoor pleasures in a systemmatic manner. She also arranged socials, house parties at the seashore, noon-hour talks on various subjects, book reviews, picnics in the parks and visits to art galleries, etc., with broken-hour girls.

Many operators were found suffering from lack of medical and dental treatment. They were actually afraid to go to the physician or dentist. The secretary accompanies them, when necessary.

The secretary is provided with a desk in the rest-room, but has no authority whatever over the operators. Her duties are to work *with* them, not *over* them. She is not tied to a regular routine, but is expected to report at the usual office hours, the same as other employees.

Do the operators appreciate these efforts in their behalf? The following statements of operators speak for themselves:

"Wish every one could work for a company that takes such an interest in its employees."

"Since I've been reading the books furnished by the company I'm a better girl. Even mother notices the change."

"I was sick two days and you never came to see me." The secretary does not call until the operator has been absent three days.

"I prefer to leave my niece with a company which looks after the welfare of its girl employees;" statement of a business man in Los Angeles.

"We girls like to feel that we are considered worth something to the company."

Besides looking after the needs of the girls, the secretary has discovered many things that are of especial benefit to the company. Two operators, chums, were absent several days, supposedly on account of sickness. When the secretary called the girls were not at home, but were sojourning at a beach resort. The result is not hard to guess. Two other operators were trying to hold positions and at the same time take care of children. Homes were found for the children and the mothers are now excellent operators.

Is the expense justified? That question can best be answered by: Are loyal employees an asset to a company? The Home Telephone & Telegraph Company, of Los Angeles, considers them as such. And its service proves the correctness of the theory. When a company adds 4000 telephones to its plant in one year, in the face of competition, there is a reason. And the fact that not one of the telephones was solicited makes the reason more apparent. The company claims its service is not surpassed in the United States by any company having an equal number of telephones, 30,000, and it considers its method of handling employees is in a large degree responsible for its success.

The expense will, no doubt, be considered unnecessary by a great many managers, but the secretary has been at work over a year and her employers consider the cost more than warranted.

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How the Independent Company, at Erie, Pa., Profited by the "Two Telephone Nuisance" Argument

When conditions of advantage are liable to change, it is dangerous to base an effort to secure business on arguments of principle. The people of Erie, Pa., have heard and read more or less about the evil of two telephones, and at last the Business Men's Exchange decided to find out just how much they were being "annoyed," collectively, in this way. An interesting and somewhat amusing feature of the situation was the promptness with which Mr. John Z. Miller, the general manager and superintendent of the Mutual Telephone Company, took advantage of the situation and encouraged the business men to proceed. The first report on the subject was issued by the Erie Builders' Exchange, and shortly after it appeared Mr. Miller distributed a well printed folder bearing the title "Why Pay for Two When One Will Do?" and containing the following text:

"The Erie Builders' Exchange has just issued a 'Telephone List, Supplemental to Bell and Mutual Telephones.'

"This organization is composed of the building interests of Erie, and the list fairly represents the comparative use of the two telephone systems in the city.

"The list shows that there are 109 telephones used by the members of the exchange. Of this number there are 37 Bell telephones and 72 Mutual telephones. Number in list who have Bell telephones and no Mutual, 2; number in list who have Mutual telephones and no Bell, 35.

"Out of the entire list of those who have telephones, there are only two people who cannot be reached over the Mutual lines.

"In view of the many conflicting reports of the comparative strength of the two telephone companies, it is interesting to look at this list of the Builders' Exchange as the unbiased statement of a disinterested party.

"A telephone system is valuable in proportion to the number of people you can reach over it. What is here shown concerning the telephones used by the Builders' Exchange, is true of all other lines of business. We could give figures to show that in every line of trade and manufacture, there is an extremely small percentage of people who cannot be reached over the Mutual telephone. After considering this, is there any doubt left as to the comparative value of the two systems?

"This thought naturally arises in the mind of the conservative business man: "Why should I pay for telephone service over two systems, when I can reach all the people over one? Or why should I pay 50 per cent more for service over a line that connects me with only half the number of subscribers?"

"Consider in connection with the above, that the Mutual Telephone Company is owned and controlled by Erie capital; that its rates are the lowest; that its service is the best; and that it is established, and is bound to continue, on the principle of fair dealing.

"Subscribe for a Mutual."

It is understood that in Erie about the same proportion of users of each system to the total number of telephone users reported by the Builders' Exchange holds among other businesses. For example, there are in Erie 25 plumbing establishments, all using Mutual telephones, and of these ten have the Bell instruments. Following the precedent set by the Builders' Exchange the secretary of the Business Men's Exchange was instructed to prepare a statement showing what members are using telephones, and what telephones they use. Following is the statement which he submitted at a recent meeting:

Number of members enrolled	459
Members having telephones	418
Members having no telephones	41
Members having Mutual telephones	225
Members having Bell telephones	158
Members having both telephones	109
Members having Mutual exclusively	116
Members having Bell exclusively	42

The difference between this statement and that of the Erie Builders' Exchange is believed to result from the membership of the Business Men's Exchange, in which are a large number of small retail dealers, news stands, tobacco stores, etc., where the Bell Company is reported to have placed free telephones and toll stations without guarantee. The Mutual Company does not consider these legitimate subscribers, but of course they show up in the count.

While no definite action has yet been taken by the Exchange, the discussion has been most beneficial to the Mutual Telephone Company in showing the much larger use of the Mutual telephone over the Bell service and the result of its preparation has been the cutting out of many Bell telephones.

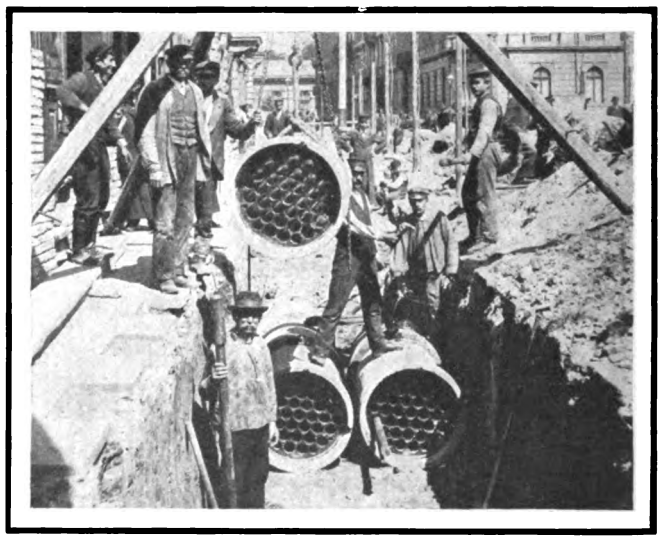
At the present time the Mutual company has over 3000 telephones connected with its exchange in the city of Erie, exclusive of country lines, which is over twice the number of the Bell city subscribers. Its strength is due in part to the character of its stockholders list, numbering over 400 residents of Erie, and to the character of its business methods and high-grade service, given from a plant which is of the best type, a new common battery switchboard having been recently installed.

Hitherto the use of the argument that two telephones are a nuisance has been almost entirely confined to the Bell company, but this case seems to show that, regardless of its intrinsic truth and merit, it is a dangerous business proposition to employ it now that there are so many cities where there are strong companies locally owned.

Reports of Telephone Companies in Northern Europe

The reports from the annual meetings of the Stockholm, Sweden and Moscow and Warsaw companies of Russia are just out, and it is very interesting to note the remarkable progress made by these companies. They are controlled by the same interests, and have up to the last year been under the able and energetic management of Mr. H. T. Cedergren.

The Stockholm company has successfully operated for twenty-five years, the last fourteen of which have been in the face of most vigorous government competition. Under these conditions it shows, according to latest reports, a total subscribers' list of 48,496 telephones, of which 40,542 are within the city limits, and 7954 in the suburbs and surrounding smaller towns. Last year's increase of new subscribers was 3376.



Russian Workmen Laying Conduit in Trench.

The net profit for the past year was $543,753. A dividend to the stockholders of 18 per cent was declared, and the balance, $405,243, was carried to the reserve fund.

The maintenance expense is remarkably low, due to high-grade material being used throughout the whole plant. All telephones and switchboards used by this company are made by the Stockholm factory of the L. M. Ericsson Telephone Manufacturing Company, which also made the equipment for Moscow and Warsaw.

The Moscow plant, which was installed in 1902-03, after the

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Bell franchise expired, has 19,308 subscribers, whereas the Bell company, after twenty years' operation, only had about 8000 subscribers.

The net profit for the last year was $128,260. An 8 per cent dividend was declared and $15,144 was carried to the reserve fund.

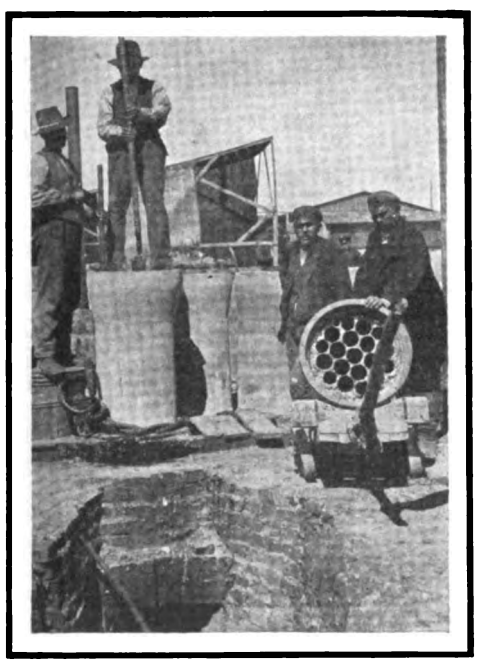
The Warsaw company, for which a plant was installed in 1902-03 after the expiration of the Bell franchise, has had a particularly successful year, and shows an increase of 3184 subscribers. The total number of subscribers is 12,491, an enormous gain considering that the Bell company only had about 5000 subscribers, and these figures speak well for the way the service is handled.

The net profit for the last year was $50,783 and a dividend of 8 per cent was declared. The balance, $19,776, was carried to the reserve fund.

These two Russian plants have the largest switchboards ever built by their manufacturers, and are said to have an ultimate capacity of 34,000 in one multiple.

An interesting feature of these boards is the use of the so-called flexible multiple; that is, all the calls coming in on one answering section are transferred by the operator, without answering the subscriber, to a connecting operator at the multiple section. This operator answers the call and gives the connection. In front of the answering operator's position are a series of lamps corresponding to a group of operators. These lamps show when either of the operators is busy, so that the load is distributed evenly and without loss of time. For every connection there are only two plugs used, so that although all the service passes over the trunk lines these are completely automatic in their operation, and no more chance of cord trouble is experienced than in an ordinary multiple system. It is evident that the number of multiple operators is increased and decreased with the service, which considerably lessens the expense.

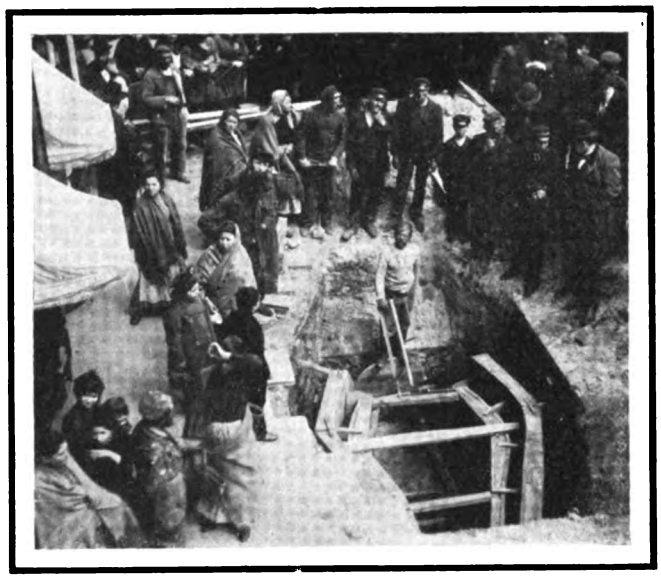
Each operator is assigned a number and is known as operator No. 11, etc. When a call comes in the operator instead of requesting the telephone number from the subscriber, gives her



Preparing Multiple Duct Conduit, Assembled in Circular Shell, for Installation in Russian Underground Plant.

own number. The subscriber is, therefore, in a position to make a complaint against the operator in case the connection is not properly made. By this method much of the trouble between operators and subscribers, so frequent in America, is avoided.

Another interesting feature of these plants is that the distribution of cable takes place in the yards of the city blocks, the distributing cables being brought up along the wall of the house with the terminating box on the wall. The cable is protected by an iron pipe, and both box and pipe are painted to



Excavation for a Manhole in a Russian City.

match the color of the house. This system eliminates unsightly and objectionable poles.

The same system is also used in the new Independent plant at Mexico City.

The Use and Value of Toll Circuit Maps*

By Miss Fannie Hiddie.

In 1896 the first Independent toll line in Michigan was built by the Citizens' Telephone Company, of Grand Rapids, from Grand Rapids to Holland, a distance of 25 miles. Since then our system of telephonic intercommunication between cities and towns has reached a point in its development where at least 15,000 miles of toll line are now distributed over the State of Michigan alone, to say nothing of adjoining States.

The toll-line business of a telephone company is governed by laws as immutable as the laws of nature, and in principle it may be compared with springs, brooks and rivers entering or leaving the territory of any company in any direction. The character of the toll service given by the several telephone companies needs to be such that patrons shall be unable to discover by any peculiarity in the service that there is more than one telephone company. It is the duty of the companies to so adjust their methods and relations that no complaint can arise on account of an uneven balance or a failure to provide good and prompt service. There should be no congestion in the stream of business where an unrestrained flow must be maintained, inasmuch as congestion is followed by disaster.

To obtain this condition the points essential for successful routing should be thoroughly understood. In order to aid the toll operators in this a circuit map may be placed where they can refer to it at a moment's notice. Toll operators should bear in mind that nearly all stations are reached by two or more routes and should not cease in their efforts to reach the destination until every available route has been tried.

The following incident illustrates the importance of toll operators knowing the circuit map: Some time ago, while the writer was visiting one of our smaller exchanges, a relief operator had a call. The direct line to the station was out of order and she was about to cancel the call when it was suggested that she consult the circuit map. Seeing

*Abstract of a paper read at the convention of the Michigan Independent Telephone Managers' Association.

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no map in the operating room, a search was made and the map found hanging on the wall in the manager's office. When this map was shown to the operator she stated that she had seen it, but did not know for what it was used. If this toll operator had been in the habit of using the map the call would not have been delayed, with the risk of being canceled. Managers may know and understand the circuit map thoroughly, but should likewise instruct toll operators, and those who may possibly be called upon to relieve on toll-line work, in the value of the use of the circuit map.

Circuit maps are frequently consulted in the office of the Citizens' company at Grand Rapids and experience has fully demonstrated their value. An instance occurred recently where the map was indispensable. Workmen, engaged in lumbering operations near Grand Rapids, felled a tree across a lead of wires, putting out of commission all northern toll lines. As Grand Rapids is the most important switching station for northern points, an emergency outlet had to be provided. This was quickly done after referring to the circuit map.

Managers should see that toll operators are kept posted of changes in routing and new points added on the construction of new circuits. For example, the Citizens' Telephone Company's new Grand Rapids-South Bend toll line enables connection to be made with stations in Cass, Van Buren and Berrin counties, which were not reached before. It also improves the service with Indiana points. This should be noted on circuit maps on all offices likely to be able to use this routing.

It might be advisable for exchanges in Michigan to have as a reference "Rand & McNally" handbooks of Michigan, Ohio and Indiana. These books will aid them materially in locating stations and routing calls. They may receive calls for stations not listed in the rate book, but if on referring to "Rand-McNally" they may find the name of the station, also its post office, which, as a rule, gives the location of an exchange that furnishes the required service.

To illustrate: A call may be received for Rustford (Rural Free Delivery Morley). Morley is the post office for Rustford. It is also Rustford's telephone exchange. Managers, where is your circuit map, in your office or in the tool room? Look it up when you get home, for circuit maps, like tariff books, become indispensable after their value has been appreciated.

Goose Flies Into Power Circuit and Puts Near-By Telephone Lines Out of Commission

From California comes what seems to be a perfectly authentic report of an extraordinary case of interruption of toll service. A goose flew into the high-tension lead of a power company, and one of the results was that transmission over a telephone line parallel with the power circuit was rendered uncommercial. A circumstantial account of the incident was recently forwarded to Mr. W. C. Hendricks, division superintendent of the Pacific Telephone & Telegraph Company, at Sacramento, by Mr. A. H. Tucker, the company's manager at Redding. He says in part:

"During February, when wild geese were going north, a flock flew into the high-tension wires of the Northern California Power Company wires at a point fifteen miles east of Redding. When the first goose struck the wires, which composed a three-phase triangle, carrying 20,000 volts, with an air space of 30 inches between the conductors, it formed an arc, no doubt between the goose's head and its feet or tail, and the bird dropped to the ground. However, the arc lasted until it fused one of the conductors in two and one end fell into a creek, grounding the circuit. Two other geese were killed in the near vicinity, and all three were found by the repairman, dead.

"When the power company's wire parted it fell across and made a permanent contact with the power company's telephone line, built on the same poles. This caused a fire in the Redding office of the company, and also in Manager Johnson's residence at Redding, and burned a number of buildings at Whitehouse, a mining camp a few miles from Redding. There might have been several fatalities at the fire of the Redding office, had the firemen who turned out been allowed to turn the water on the place in flames, where the wires entered the building. A rope was placed around the entrance wires and they were torn loose. I might add that the telephone wires that caused the fire were fused with a 12-inch fuse on each wire and protected with a ground connection, separated with a thickness of paper.

"To guard against a repetition of this accident, there was a man with a shot gun stationed where the geese were frequently flying over. His instructions were to keep the barrels warm when any geese were in sight.

"When one phase of the power circuit was open, and especially when it was grounded, the circuit was unbalanced, and this made its inductive disturbances greater. The particular line in question runs from a power house to the Redding substation of the power company, and it does not travel within a reasonable distance to cause us to believe its magnetic field includes our toll wires, but a branch of the power circuit, fed from the same source, runs from this line to Red Bluff and points south, a distance of perhaps eighty miles. In this section we have toll lines paralleling the power lines at various distances, in no place closer than 50 ft., but always within the field of induction of such a high alternating potential. The induced currents after this accident so disturbed the efficiency of our toll lines that it was impossible to carry on a conversation over them. This was not only south from Redding, but on all toll lines running north and away from the power wires.

"So heavy was the induction on our lines that in taking out a fuse it would spark as if it were charged with a heavy current. Our toll wire chief was so sure that our wires were in trouble that he started a man with a team both from Redding and Red Bluff.

"This class of trouble is not considered rare in this district, the same power company having had a number of similar experiences, although possibly none has caused so much trouble as this one. One of the most singular happened a few months ago. The accident occurred about four in the morning, when a large owl carrying a rabbit in his talons flew into the wires and caused the fuses to blow out on the main line, but there was no arc to fuse the wire off. Both the owl and the rabbit were recovered and brought in for inspection. The power was not shut off more than thirty minutes."

Field Telephones for Mexican Army

The Mexican army is to be equipped with a complete and modern field telephone system. The order for the necessary apparatus has been placed by the War Department with a concern in Germany. The shipment will arrive in a short time and the work of equipment and distribution will begin. In addition to the field telephone system, the government will connect all of its military posts with railroad and telegraph points by means of telephone lines.

To test the practicability of field telephones, the War Department equipped the battalion of Zapadores of the army with the apparatus recently, and a series of tests was made of the system. These experiments proved highly satisfactory. It was demonstrated that a continuous battery discharge by heavy artillery ordnance does not interfere with communications by this telephone system. Many parts of Mexico are not reached by railroads or federal telegraph lines and the necessity of providing the army with some means of establishing communication with the military centers in times of campaigns, such as is now being conducted upon the frontier of this country, led to the adoption of field telephones. Special telephone corps will be organized in the army to operate the field telephone systems. It is stated that these corps will be separate from the army signal corps, which now form an important branch of the government military service.

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Rate Discrimination and Toll Switching Compensation in South Dakota

The question of rate discrimination brought up in South Dakota, as mentioned recently in the columns of this journal, is a matter of considerable interest in many sections of the country. A local correspondent, who is in a position to be thoroughly conversant with the details of the situation, furnishes us the following statement:

The Legislature of South Dakota in its session of 1907 passed an act creating a telephone commission, and giving it power to prevent discrimination and fix rates which telephone companies shall charge in furnishing service to the public. Under this law the Traveling Men's Association of the State of South Dakota made complaint to the Telephone Commission, alleging that the Independent telephone exchanges were charging unreasonable fees for terminal services. A hearing was called by the Telephone Commission on this complaint, and notice was served on the president of the South Dakota Independent Telephone Association to appear and make defence against this complaint. The South Dakota Independent Telephone Association appeared and answered, and while admitting that there was discrimination with reference to the toll line services, it denied that this discrimination was the fault of or was chargeable to the local Independent exchanges. In its answer the telephone association alleged that local exchanges as such are not in the toll business; that their business is furnishing service from one of their own stations to another of their own telephones and stations, and that they are in no sense in the business of transmitting messages from one town to another. It was set forth that when they undertake to administer the terminal facilities of the toll lines they simply act as the agents of the toll companies and charge them for the use of the terminal facilities, while the toll companies undertake to receive messages at the local exchange stations, and to deliver them at the local exchange stations in the towns to which they are sent, and that necessarily this must be done, for the reason that business men would not tolerate the condition of going to booths to send their toll messages, or to receive them. It was stated that the toll message must be brought to the desk of the patron in the business house, office and home, and that is what the toll companies undertake to do and charge a message fee for that service.

If the toll company owns the terminal facilities, then it is in a position to perform that service with its own facilities, and if it does not own terminal facilities, in order to perform the services which it agrees with the sender of the message and the public, it must hire the owner of the local independently owned exchange to deliver the message from its switchboard to the station on the local exchange held by the receiver of the message. This involves the toll companies in paying for this terminal service.

In South Dakota the toll companies own a number of local exchanges. It has been the custom with some of them to make a message charge coming to these exchanges and towns less than when a message is sent to another town where the local exchange is owned independently, the reduction being determined by the amount which the company has to pay for terminal facilities in other towns. To illustrate: The toll charge from Canton to Sioux Falls is 15 cents. The toll charge, including what is locally termed a message fee for the local Independent exchange at Canton, is 25 cents, making a difference of 10 cents or 40 per cent between a message going into Sioux Falls from Canton and a message going out of Sioux Falls to Canton. This is certainly discrimination, so far as the public is concerned. The rate for a given distance should be the same each way.

The toll companies claim that the reason for this discrimination is because the local exchanges charge what they term a message fee. The local exchanges answered this contention and said that it is in no manner a message fee; that it is compensation for the use of the terminal facilities and the labor performed in conducting this toll service. The local exchange must perform all the work relative to the sending of a message; must use its own facilities to bring the message to the local station from the central office, and then must get the lines cleared in order to reach the points where the message is to be delivered. It must make all connections. The exchange operators assert that a reasonable compensation for the use of terminal facilities and the labor performed in delivering and receiving a message is 20 per cent of the toll charge. One large toll company in the State claims that 10 per cent on the outgoing message is all it pays the local independently owned exchanges for this service, and five cents on the incoming message, regardless of the distance over which the message is sent or the amount of the toll. The local exchanges in their answer state that such a fee is in no manner compensatory. The Independent Telephone Association contends that a rate should be made which is at least compensatory, and that a compensatory charge would be five cents per message on both incoming and outgoing messages, where the amount of the message is 25 cents or less; when the toll charge is more than 25 cents and under 75 cents the commission should be 20 per cent of the toll message, and when over 75 cents the commission should be 10 per cent on the excess.

It is well known in telephone circles that the work performed by the sending station is a great deal more than that performed by the receiving station, for the reason that the sending station must procure the lines cleared, get the party called to the telephone and make the collection of the toll, while the receiving station only calls the local parties to the telephone of the local exchange. In practice, however, the South Dakota toll companies have been paying less for the outgoing message than for the incoming, which the local exchanges claim is not just.

Another discrimination which is made, as charged by the Independent Telephone Association, is that where a telephone message passes over more than one toll line, it is the custom of a number of toll lines to charge the sum of two locals. That is, they add the charge locally made by one line to the connecting station to the charge made by the other line from the connecting station to the receiving station. This makes the charge a great deal more than when the same company owns the line for the entire distance. The local exchanges claim this is discrimination on the part of the toll companies, and ask the Telephone Commission to so adjust all the rates in the State that substantially the same charge will be made for similar services, regardless of the number of toll companies engaged in performing the services. If a message passes from Mitchell to Chicago, it passes over quite a number of toll lines. There are but two terminal fees charged, the one at the sending station and the one at the receiving station. Certainly no terminal switches are made en route, hence there is no reason why the toll companies should charge the sum of two locals. Again to illustrate: The rate from Canton to Yankton sent over the lines of two companies is 20 cents. The toll company's charge from Canton to Mitchell is 50 cents. Here is 150 per cent difference while the distance is the same. The local exchanges claim such a charge is discrimination against the business men of Mitchell, and that the commission should adjust these toll charges so that one town in the State should enjoy identical services and identical charges as every other town similarly situated. The custom of the toll companies in adding the terminal charge to a toll always discriminates against the town where the terminal charge is added. This came up before the Telephone Commission for hearing, and it at once appeared that in order to settle this it would be necessary to examine into all the conditions affecting the toll companies and also the local exchanges, in order to fix rates which would be fair and compensatory. To do this involves an investigation into the conditions in every town in the State, and along the lines of all the toll companies. The Legislature had made no appropriation to defray the cost of such an investigation and the Telephone Commission is already without funds to perform its ordinary business. The result has been that the commission did not take up the hearing of this most important

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case at all and the possibilities are that it will not do so until after the meeting of the Legislature, when some legislation in all probability will be attempted, or an appropriation made to defray the expenses of an investigation with the object of securing data which may be used in adjusting the rates.

Telephone Competition in Janesville, Wis.

A pamphlet bearing the title "The Telephone Question" has recently been issued by the Rock County Telephone Company, at Janesville, Wis., of which Mr. Richard Valentine is the secretary. This pamphlet calls attention to the benefits of telephone competition in that vicinity.

It states that before the Rock County Telephone Company was organized the Bell company had a few over 300 telephones in the city of Janesville, notwithstanding that it had been in operation nearly 25 years. There were no exchanges at Darien, Sharon, Clinton, Footville, Orford, Brodhead, Evansville and Milton. Its lines were all on the old grounded single line system; its instruments were of an obsolete pattern and its rates were $4 per month for a business telephone and $3 per month for residence service. For a "long distance" telephone and metallic line it charged $5 per month, and in some instances more. Such a thing as a farmer having a telephone was never known, for the Bell company absolutely refused to install telephones in farmers' houses except at very high rates. Its toll lines were principally grounded wires. To talk to Milwaukee it was often necessary to have a message repeated by the operators at Whitewater and Waukesha.

Nine years ago the Rock County (Independent) Telephone Company was organized and an exchange built in Janesville. It established rates of $2 per month for business telephones and $1.50 per month for residences. It gave every subscriber a metallic line and installed the very best long distance instruments and high-grade switchboard and protective devices. It opened for business with 380 subscribers, and notwithstanding its list of subscribers has now reached almost 2000, it has advanced its rates only 50 cents per month for business telephones.

Immediately upon the opening of the Rock County telephone exchange the Bell company reduced its rates to $1.50 per month for business telephones and $1 per month for residence service. These rates remain the same to-day, and for the past few years it has offered a further inducement by giving three months' free service to all new subscribers. Its officials admit that it loses money at these rates. They are believed to make them for the purpose of driving the Rock County Telephone Company out of the field.

The probable effect of discontinuing competition is pointed out by reference to the examples furnished by Oshkosh, Fond du Lac, Eau Claire and Chippewa Falls. These cities formerly had Independent telephone exchanges with rates the same as the Rock County rates in Janesville, which, after a few years of endeavor on the part of the Bell company to drive out of business by cutting rates below cost, giving away telephones, etc., the Bell company finally acquired by purchase. It immediately advanced the rates in those cities from $4 to $5 per month for business telephones and $3 per month for residences.

It is also stated that within the past year the Bell company has secured control of the Independent Telephone Company in Beloit through a merger, and has advanced the rates to nearly double what they were before. The Independent company claims not only lower rates, but a superior service. It is adding subscribers at the rate of over 200 per year.

Objections to Telephone Rates Based on the Zone System of Charging

In connection with the recent reduction in toll charges from 10 to 5 cents in the Boston and suburban exchanges of the New England Telephone & Telegraph Company within a radius of about five miles of the business center, considerable objection to the new conditions has been raised by residents of Dorchester. It appears that this suburban district is located partly in the Milton exchange limits and partly in the Dorchester exchange, though politically a part of the city of Boston. It, therefore, comes about that part of the residents of Dorchester are obliged to pay 10 cents per five-minute toll call to the city proper, since that is the rate from the Milton exchange, while other residents in Dorchester attached to the exchange of the latter name pay 5 cents per call. The second contention arises from the fact that it costs the subscriber in the Dorchester exchange twice as much to telephone to Milton as to Boston proper, although in many cases the distance between the two suburban points is half as far as the heart of the city.

Cases of this character illustrate the extreme complication of the telephone rate problem in any metropolitan community composed of a central business city surrounded by numerous residential suburbs. In the supply of all public service at varying rates it is inevitable that where any zone system of charging is in effect, some hardship must be borne by those who live just beyond the line drawn between limiting sections. On a street railway system where a 5-cent fare covers a run of a dozen miles into the suburbs, the man who lives half a mile or so beyond the 5-cent fare limit finds it a hardship to pay a second fare for the short ride left after he reaches the end of the nickel service, but he has no just cause for complaint as long as the charges are based on 5-cent units. The Dorchester subscriber who cannot telephone to Milton, the nearer point, for as low a rate as to the Boston exchange, has the same conditions to face, granting the right of the company to establish zones within which rates shall be uniform. Even if a radial system of rates based on distance were in effect, there must always be some line drawn to separate the zones, however narrow the latter may be. It is possible that when the report of the highway commission is made upon the general Boston and suburban rate problem, some graduated system of charging between adjoining and adjacent suburban exchanges may be placed in effect to minimize the inevitable differences that now exist, but meanwhile it is not easy to see any unfairness in a lower rate between a suburban point and the city, where presumably the maximum traffic flows, than is granted between the same suburb and a nearer but probably less important community from the standpoint of the desires of the telephone users who are located in the first suburb.

The trouble arising from the division of the district into two separate exchanges, one of which is within the city limits and the other without, involves the broad problem of the right of an operating company to classify its subscribers without the closest regard to their political residence. It is an advantage when the city and town lines can be made the zone lines of rate changes, but where this cannot be done without interfering with the quality of the service or greatly increasing the cost of operation, it does not appear that injustice to the subscribers as a whole is done when necessarily arbitrary lines are drawn locally. All the conditions leading up to the location of an exchange need to be considered in passing upon a matter of this kind, and the good of the service as a whole, combined with a reasonable return for the company upon its investment after operating expenses, taxes and depreciation are paid, are the issues to be borne in mind.

The Protecting Telephone on the Farm

A Michigan man who travels extensively recently remarked: "Farmers all over the country are getting to live more like city folks. I take in the whole South and notice it there. One of the best things that ever happened to the farmer was to have put within his reach the telephone. It is a convenience in Michigan, but it is more than that in the South. White women down there have more or less fear of the negroes, and now when the rest of the family goes away and leaves a lone woman at home, she does not feel as insecure as she did before the telephone came into use. If she sees a suspicious looking prowler she calls up her nearest neighbors or relatives and it isn't long before a few good men come galloping over."

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

House Moving in South Dakota

Is there a law or decision of the courts in South Dakota or other States, in regard to liability of persons moving buildings through the streets of incorporated villages, cities, or towns where there is a telephone system in use, acting under a franchise—the company incorporated under the State law—doing public business, to enable the telephone company to collect payment of expenses caused the company in taking down or cutting its wires to enable those parties to pass through with the moving building?

We do not know of any law or decision of the courts of South Dakota in regard to the liability of house movers, but the principles of the common law would apply. If a telephone company is put to expense in taking down or cutting its wires to enable the house mover to pass through, the company can collect payment by an ordinary law suit against the parties who damaged it. The best way to handle these matters is to require a bond from the house mover to pay all expenses and hold the company harmless from injury. If the house mover is unwilling to indemnify the company in this way, the company may issue out an injunction to restrain the house mover from interfering with its wires. A license from the city giving the house mover permission to move a building through the streets is no protection against such an injunction at a suit of the telephone company. The use of the street for moving houses is an extraordinary one, and, while it may be permitted, it cannot be allowed to destroy the use of the streets for travel or necessary public purposes. No such use of the street can be made impairing the vested rights of the telephone company.

Northwestern Telephone Exchange Co. vs. Anderson (N. D.) 98 N. W., 706; Nagel vs. Hake, 101 U. W., 409.

Application of Texas Anti-Pass Law

Does the Texas anti-pass law apply to the operating telephone companies in Texas or does it apply only to those which hold a charter from the State of Texas?

We understand that the Texas anti-pass law applies to all telephone companies operating in the State, no matter from what authority they hold their charter. It does not apply to interstate business, however, as that is subject to the regulation of the Federal Government under the interstate commerce clause in the National Constitution.

When Insulation Is Not Intended as a Safety Device Its Condition Is Immaterial in Personal Injury Case

A painter, while working on the roof of a building, received a current of electricity from the wires of an electric company, one of which, a neutral wire not carrying a heavy charge, was located 11 in. outside the edge of the roof, and another, an outside wire in a 2300-volt circuit, was located 25 in. from the roof. The painter was injured by the contact, and, when found, his hands, each of which grasped one wire of the pair, so that his body bridged the circuit, were badly burned. In a suit against the company, the painter testified that the injury was caused by his contact with the wires nearest the building and that he could not have brought his hand in contact with the outside wire in the first instance, while the company's evidence showed that the wire nearest the building could not have caused the injury. After a judgment for the plaintiff, the Supreme Court of Wisconsin, on an appeal held that it was error to so submit the case that the jury might refer plaintiff's injuries to contact with either wire, and to charge the company with negligence in maintaining either or both of them. It was shown that insulation on the wires with which the plaintiff came in contact was not intended as a safety device, but only for the protection of the wires. Hence, it was held error to permit the jury to find that such insulation was old, weather worn, broken and out of repair, so as to afford no protection against the electric current to a person coming in contact with it.

Rasmussen vs Wisconsin Traction Electric Co., 113 N. W., 453.

Subscriber's Right to Deduction for Interrupted Service

In 1906, Messrs. Hardwick and Fuller, of Staunton, Ky., made a contract with the Eastern Kentucky Telephone & Telegraph Company, by which it agreed to construct a telephone line of at least ten wires from its exchange in Clay City to the town of Stauton, and to maintain them during the life of the contract. Hardwick and Fuller guaranteed that the company should have as many as twenty regular subscribers who would pay $1.50 per month for residence and $2.50 for business telephones. They also agreed to furnish enough money to build and equip the line, on which they were to have interest at 6 per cent. The company was to make out the receipts for the use of telephones and deliver them to Hardwick, and upon delivery of receipts, it was to be credited on the debt for the money advanced. The line was built, Hardwick and Fuller furnishing about $1,200. About November 1 the company made out and delivered to Hardwick receipts for about $400 for a year's rent of telephones. Soon after, Hardwick and Fuller sued the company for the money they had advanced on the ground that it had failed to properly maintain the telephone line, and had permitted it to be out of repair so as to destroy the value of the telephones. From a judgment for the plaintiff, the company appealed and secured a reversal in the Court of Appeals in Kentucky. The court found that while there was delay in some cases in remedying defects there was nothing to indicate fraud or bad faith on the part of the company. The court held that the company would be liable only for the amount of rents reduced by reason of its negligence in remedying defects. The case was transferred to equity and referred to a commissioner to ascertain what reductions the different subscribers were entitled to, in accordance with the rule that a telephone subscriber is only entitled to a deduction from his bill on account of interrupted service, after the company has had notice and reasonable time to repair the trouble.

The court laid down the following rule concerning the service a subscriber has a right to expect: "A telephone subscriber is presumed to know that his telephone is apt to get out of order, and that a line running through the country may sometimes get down, and, though a telephone company must use ordinary care in constructing and maintaining its line, it is not liable for interruptions not preventable by ordinary care."

Eastern Kentucky Telephone & Telegraph Co. vs. Hardwick, et al., 106, S., 307.

All Companies Who Use Pole Liable for Its Condition

Judge Thompson, at Cincinnati, Ohio, in a memorandum opinion has overruled the demurrer of defendants in the case of Thos. Toohey, administrator of the estate of William Toohey, deceased, vs. the Dayton Lighting Company and the Central Union Telephone Company. William Toohey, while in the employ of the telephone company as a lineman, climbed a pole on which were strung wires of both defendants. The pole broke at the street level and suit was entered for $10,000 damages. It was shown that the pole was 20 years old and rotten. Judge Thompson says that the deceased climbed the pole as the servant of the telephone company under a usage established to promote the mutual advantage of the two companies and it was the duty of both to exercise reasonable care and prudence to protect him against injury by reason of the rotten condition of the pole.

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Practical Questions and Answers*

Edison Battery for Operator's Transmitter (1044)*

Will you tell me if the Gladstone-Lalande battery or the Edison-Lalande is satisfactory for switchboard transmitters on a magneto system? I am using a bluestone battery, but it is not satisfactory.

A local battery operator's transmitter should have not less than three volts to do good work. This means that if you use bluestone battery you need at least three cells. If you have less that may be part of your trouble. The Lalande battery, either Gladstone or Edison, gives about .66 volts per cell. Four cells will give 2.64 volts, five cells 3.30 volts. The internal resistance is lower than that of the bluestone battery, and better from that standpoint. The Lalande battery is successful if you can afford its expense, as it costs more to run than bluestone. It is cleaner and needs less attention than the latter. But if in the hands of a man who knows how to care for it, the bluestone battery is very satisfactory.

Proper Division of Toll Receipts (1045)

I have noticed several articles in this paper recently relating to division of toll where calls are completed over lines of more than one company.

If this is actually practised, could you secure and print the basis of settlement used by some one dealing with conditions similar to the following?

W is 36 miles from the main office of a long distance company, being the terminus of one copper circuit, and cut in on two other circuits extending further. Connecting *W* and *S*, an exchange 12 miles away, is an iron trunk circuit, owned in part by the owner of each exchange. Connection is made at *W* for all calls between *S* and the stations reached by lines of the long distance company.

For switching, or use of the line, is *W* entitled to any part of the toll charged for calls requiring use of both lines for completion of the call?

The manager of the long-distance company states that it is customary throughout the East for small operating companies, having but few miles of toll line, to give the use of the line to a strictly long-distance company and do the necessary switching free. It has proved quite a burden as a matter of expense and otherwise, over 90 per cent of total calls switched over this line originating at other points, leaving less than 10 per cent from which any revenue is derived.

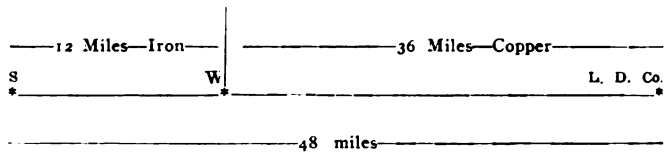
There are many different opinions as to how matters of this kind should be handled, and in replying we will state the methods in use by the Michigan Independent Telephone Traffic Association. Information on the application of these to the case you mention is available through the courtesy of Mr. W. S. Vivian, secretary of the association.

The proposition is that there is an iron line from *S* to *W*, owned by the company at *W*, which is 12 miles long. There is a copper line running from *W* to the long distance company's exchange, which is 36 miles long, and from the long distance company's exchange there is an additional circuit radiating throughout the country.

First of all, it is unjust to expect this smaller company, at *W*, to provide circuits to and from points on its system and handle the business over its lines and switch it without any remuneration. It also seems to be questionable if the company owning the iron line should receive the same amount per mile as the long distance company with copper circuits representing an investment several times greater per mile.

So far the Michigan association has never been able to arrive at a basis for dividing this iron and copper line business, owing to the complications which immediately arise when trying to separate the iron line messages from the copper line messages. One can readily think of conditions where a message would go over the lines of three or four companies, two of these perhaps being iron lines and two of them perhaps being copper lines. With each of the four companies it would be possible for it to go either over iron or over copper lines, so that in separating this business it would mean keeping a record of the routing of each message through the several switching points it might pass in going from the point of origination to its destination. Therefore, a record is kept of this business only by the routes and no attempt has been made to distinguish between iron and copper line business.

Going back to the proposition as submitted, an illustration is given in which it is shown that it is 48 miles from *S* to the long distance company's exchange and according to the Michigan schedule of rates, the rate would be 25 cents. After deducting the originating commission of 25 per cent there would



Rate—25c.
Originating Commission (1 message) 25 per cent..... .0625
Pro rata of company owning iron line, 25 per cent of .1875 or..... .0469
Pro rata of company owning copper line 75 per cent of .1875, or..... .1406
.2500

Method of Dividing Toll Receipts.

be a balance to pro-rate of .1875, of which the company owning the iron line would be entitled to 25 per cent, or .0469, and the company owning the copper line would be entitled to 75 per cent, or .1406.

If there is a large amount of business between these two points during the month, the same percentage would stand in making the settlement, the percentage only changing with the different combinations of towns with which the office at *S* would do business.

Magneto Telephone Trouble (1046)*

Though not a telephone man, I am interested in the telephone and want to learn more about it. I would like to work into the business. The telephone in our house has been giving trouble for some time and has not been fixed. It rings all right, but while talking the other person's voice is raspy and cuts off. Some times we can hear well, but the other party complains that he can't hear me. He says it cuts off. I have traced off a diagram of the wiring of the telephone, but it was done long before the trouble came on. The bell is marked 1600. Where do you think the trouble can be? We are on a line of our own to central.

As you describe it there seem to be two troubles. The trouble which cuts off the other person's voice is most likely in the line circuit, and may be anywhere from your ground rod to central. A loose connection or a loose ground will do the business. A connection may be just loose enough to bother the talking current, but ringing current, being of higher voltage, may break down the resistance and go through all right. To make sure that the trouble is not in your own telephone, the next time the other person's voice cuts off, quickly short circuit your telephone at the binding posts on top and blow on the transmitter. You should hear the rushing sound in your receiver continuously. If it breaks when you move the receiver cord, it may be that the latter is worn out.

Your second trouble is probably within your telephone. Examine the battery connections and all wires connected in the same circuit. By referring to your diagram which you made you will notice that the transmitter, battery, heavy winding of induction coil, and two springs of the hook-switch are in one circuit, connected together. Look for loose connections anywhere in this circuit.

Resistance of Telephone Lines (1047)*

(1) What calculations do they make for bridging instruments on grounded and metallic lines with 1600 and 2000 ohm ringers? (2) What should be the resistance of a No. 10 BB iron wire line, 110 miles long, with 8 2000 ohm bridging telephones on the line? (3) What should be the resistance of a No. 10 BB iron wire line, 42 miles long, with 5 1600 ohm bridging telephones on the line? (4) What should be the resistance of a No. 12 BB iron metallic line, 5 miles long, with 3 1600 ohm bridging telephones connected with repeating coil at the end of the line? (5)

*Replies to queries designated by an asterisk (*) are furnished by Arthur Bessey Smith, Asst. Prof. in Telephone Eng'g, Purdue University.

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What should be the resistance of a grounded line No. 14 BB, with 5 2000 ohm bridging telephones, with five taps each one-half mile long? (6) What causes a line of the same length and size, apparently in the same condition, to have more resistance than the other?

(1) It is impossible to calculate the effect of bridging instruments on a metallic or grounded line unless the distances between all the stations and central office are known. Referring to Fig. 1047, let *A* be the telephone farthest from central. Figure the resistance of the line from station *B* to station *A*

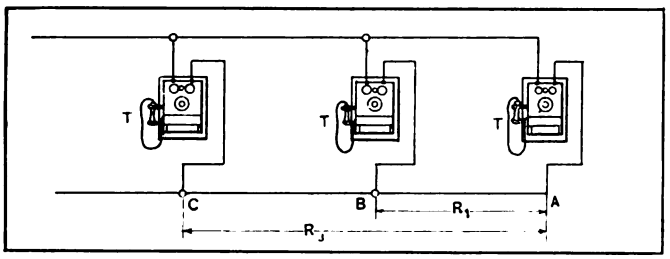

Fig. 1047.

and add it to the resistance of *A*. Call this R_1. Call the resistance of each telephone *T*. Figure the joint resistance of these last two telephones by the formula

$$R_2 = \frac{TR_1}{T+R_1}$$

that is, their product divided by their sum.

Find the resistance of the line from *B* to *C* and add it to R_2, calling the sum R_3. Find the joint resistance of the last three telephones by the same formula, putting in the new values,

$$R_4 = \frac{TR_3}{T+R_3}$$

Proceed in this way clear back to central.

(2) Assuming that the line is metallic, that the telephones are equally spaced along the line, and allowing nothing for bad splices, poor insulation, or the resistance of drop lines or branches, the total resistance would be 1445 ohms. This is based on Robling's tables of iron wire.

(3) Making the same assumptions as above with regard to spacing, resistance, etc., the total resistance would be 991 ohms.

(4) Since you have a clear line to the repeating coil, the resistance will be that of the line wire, 333 ohms, plus that of the repeating coil.

(5) Four hundred and sixty-seven ohms, calling the ground resistance zero.

(6) The irregularities in the resistance of telephone lines come from the following sources:

a. Not all wire is accurate to its gage number.

b. Especially in iron wire the specific resistance varies.

c. Leakage, which is present in all lines, may be considerably different in various lines.

d. Splices introduce some error.

e. In ground return lines, the resistance at the ground connection is often quite uncertain.

f. Temperature affects the resistance of wire.

Telephone Finances

Maintenance Charges of the Kansas City Independent Companies

In the annual reports of the Kansas City Home and Long Distance Telephone Companies are the figures showing maintenance costs for the past four years. This company makes every effort, by employing skilled workmen and exercising a high grade of supervision over their efforts, to keep its plant in the best possible condition.

The figures given are as follows:

	Home Company.	Long Distance Company.
March 31, 1905	$63,939.80	$2,089.55
March 31, 1906	93,035.42	6,532.52
March 31, 1907	119,003.72	17,229.53
March 31, 1908	140,549.19	22,737.28
Total	$416,528.13	$48,588.88
Total, both companies		$465,117.01

In connection with the application with the application of these figures to the size and type of plant, the following data are of interest:

	Home Company.	Long Distance Company.	Total.
Exchanges	7	5	12
Telephones	20,146	5,201	25,347
Poles	21,756	46,479	68,235
Cable (miles)	213.7	15.7	229.4
Bare wire (miles)	5,267	8,510	13,777
Total wire (miles), including wire in cables	51,152.8	16,005.2	67,158
Conduit (duct-miles)	218.56	4.41	222.97
Manholes	435	13	448

While the cost of maintenance per telephone gives no fair basis of comparison, as maintenance expense is so widely varied by the character and condition of the outside plant, central office equipment, and extent and character of territory, together with transportation facilities and other considerations, it is of some interest to reduce the total maintenance to the basis of the cost per telephone. On the basis of the number of telephones in service on March 31, of corresponding years, namely 11,389 in 1905, 14,831 in 1906, 18,661 in 1907 and 20,146 in 1908, the maintenance cost per telephone for the Home Telephone Company is as follows: 1905, $5.61; 1906, $6.27; 1907, $6.38; 1908, $6.98.

Commercial Union's Progress in New York

The annual meeting of the Commercial Union Telephone Company, which controls Independent telephone exchanges in Troy, Saratoga, Mechanicville, Glens Falls, Sandy Hill, Fort Edward, Lake George, Warrensburgh and intermediate points in New York State, together with toll lines connecting its central offices, was held at the office of the company in Troy, N. Y., Tuesday, July 21, 1908. The results of the year were very satisfactory to the stockholders, having shown

Gross earnings in the amount of	$180,295.21
Expenses were:	
Operating and maintenance	83,677.00
Interest on bonds outstanding	41,799.34
Dividends on preferred stock, rate 6 per cent	15,810.00
Leaving a surplus for the year of	$39,028.69

This is an increase of about $12,000 over the previous year, representing earnings of slightly over 10 per cent on the common stock outstanding. No dividend having as yet been declared, the surplus account amounts to $137,431.72.

The company has in operation in the territory slightly over 8000 telephones. Although the year did not show as much gain in telephones as the previous one, there was an increase in the territory of about 200, and also a gain in toll line earnings.

The directors elected for the ensuing year were as follows: James H. Caldwell, William Connors, Irving H. Griswold, Peter McCarthy, J. J. Hartigan, Cornelius V. Collins, Theo. M. Brush, Chas. W. Cool, William C. Geer, William D. Mahoney, Edward F. Murray, Edgar T. Brackett, B. G. Higley, Arthur MacArthur, W. Levis Burk. For inspectors of election: Irving S. Freeman and William Walsh.

Cuyahoga Company's June Statement

The June statement of the Cuyahoga Telephone Company, of Cleveland, Ohio, which has just been issued from head-

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quarters, shows the following results in comparison with those of the corresponding month a year ago:

	1908.	1907.	Increase.	Decrease.
Gross earnings	$69,222,85	$64,432.72	$4,790.13	.....
Total expenses	30,230.84	33,551.13	.....	$3,320.29
Net earnings	$38,992.01	$30,881.59	$8,110.42	.....
Interest on bonds	11,283.33	11,250.00	33.33	.....
Surplus	$27,708.68	$19,631.59	$8,077.09	.....
Deductions from surplus:				
Dividends on preferred stock.	$7,186.75	$7,186.75	.....	.....
Dividends on common stock..	.....	5,000.00	.....	$5,000.00
Reserve for depreciation	3,469.24	1,250.00	2,219.24	.....
Total deductions	$10,655.99	$13,436.75	.....	$2,780.76
Net surplus	$17,052.69	$6,194.84	$10,857.85	.....

This is considered the best statement the company has ever issued. It shows a good increase in the gross and net earnings and in the surplus, while there has been a reduction of more than $3,000 in the operating expense. The figures show that the company is earning about 14 per cent on the common stock, but no dividends have been declared so far this year for the reason that this money is desired to reduce the floating debt.

Increase in A. T. & T. Earnings for First Six Months of 1908

The net earnings of the American Telephone & Telegraph Company for the six months ended June 30 were $12,714,621, an increase of $2,178,418, or 20.6 per cent over the same period last year. The figures are:

	1908.	1907.	Increase.
Dividends	$6,443,344	$5,685,089	$758,255
Interest and other revenue..	4,951,788	3,813,182	1,138,606
Total traffic (net)	1,995,864	1,832,114	163,750
Real estate	55,735	37,541	18,194
Other sources	341,658	200,845	140,813
Total earnings	$13,788,391	$11,568,772	$2,219,619
Expenses	1,073,770	1,032,569	41,201
Net	$12,714,621	$10,536,203	$2,178,418
Interest	3,871,675	3,439,791	431,884
Surplus	$8,842,945	$7,096,411	$1,746,534
Dividends April and July	6,120,092	5,262,056	858,036
Net surplus	$2,722,853	$1,834,355	$888,498

A. T. & T. stock has advanced in the past few days.

Telephone News

Independent Toll Line Connections Must Be Restored at Delphos, Ohio

The United States Telephone Company, of Ohio, has won its suit to compel the Delphos Home Telephone Company, of Delphos, to carry out its contract to carry on toll business exclusively over the Independent lines.

Last March suit was brought by the United States Telephone Company against the Delphos Home Telephone Company, of Delphos, Ohio, to prevent it from connecting with Bell long distance lines, as the United States Telephone Company had a 99-year contract to furnish exclusive toll service. The United States Telephone Company requested the court to determine the legality of the 99-year contract. Judge Quayle has just handed down a decision in favor of the United States Telephone Company, at Lima, Ohio, upholding the legality of the contract. Details will be published next week.

Use of Telephones in Drug Stores by the General Public

At Seattle, Wash., a druggist by the name of L. F. Swift brought suit in the Superior Court to restrain the Independent Telephone Company from taking a telephone instrument out of his store because it was used by his customers. He believes that so long as he pays the rent he should have sole control over its use. The company showed that there was an average of 179¼ calls per day from the telephone in question, while the average on other telephones was only 9 2/10 calls per day.

The temporary restraining order was issued and on July 17 Judge A. E. Griffin heard the case and rendered a decision upholding the contention of the telephone company. The court found that the telephone company is justified in requiring that telephones, installed in drug stores and other places for public use, be used and operated on the nickel-in-slot plan and to charge five cents for each call. The decision states that the telephone company would illegally discriminate against other subscribers if it allowed its telephones to be used free of charge by the general public.

Latest Atlanta Independent Directory a Good Advertising Medium

The latest directory of the Atlanta (Ga.) Telephone & Telegraph Company presents a neat appearance. In size it is 6 in. x 9 in. Covers and margins of pages are used for advertising. A classified business list, in which names are inserted for a small charge, appears in the back of the directory. Directions for using the telephone and other information appear on the front pages, and a list of the exchanges operated and the long distance connections which can be obtained follow.

There are nearly 6000 names in the list of subscribers, fully warranting the extensive use of space in the book for advertising of local business houses.

The Nebraska Railway Commission's Ruling Regarding Messenger Fee

In our issue of July 11 the statement was made that the Nebraska Railway Commission had reconsidered its action in the matter of charges for messenger service by telephone companies where no messenger service is actually performed. We find the statement is in error and give below the text of the ruling to which reference was made:

"*It is hereby ordered* that all telephone companies doing business in the State of Nebraska be, and the same are hereby notified and directed from and after the first day of August, 1908, to cease and desist from charging and collecting for messenger service where no messenger service is actually performed.

"Where a toll line company has a contract with a local exchange, whereby the local exchange receives a percentage or part of the toll rates on business destinating or originating on its line, the connecting of its subscribers with the toll line at its switchboard will not be deemed messenger service within the meaning of this order, unless provided for by its published rates, filed and approved by this commission."

Nashville Courts to Decide on Right to Furnish Coin Box Telephones

The courts at Nashville, Tenn., have been called upon to decide the right of the Cumberland Telephone & Telegraph Company to install slot pay stations in stores where the proprietors object to the move. The Cumberland company recently ordered that pay stations be installed in the drug stores, restaurants and numerous other business houses where patrons use the telephone frequently. W. H. Cushman, a druggist, refused to permit the company to remove his old telephone and install the pay station, and the company is endeavoring to get a decision from the courts to compel him to permit the change to be made. The telephone company is said to have offered Mr. Cushman a rate of $54 per year for the instrument with 50 per cent of the collections over $4.50 per month. Mr. Cushman, however, alleges that he is paying the maximum rates for his telephone and his customers have the right to use it free.

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A Progressive Indiana Telephone Company

Organized in 1898 with 52 subscribers, the Commercial Telephone Company, with headquarters at Warsaw, Ind., has grown in size until it gives service at the present time to about 1100 people. Its main exchange is at Warsaw, and it has a branch exchange on the grounds of the Winona Park Association, giving service to this summer resort two miles from Warsaw, which has a winter population of 1000 and is the residence during the summer of between 5000 and 7000 people.

The company has at present a substantial plant at Warsaw with ample capacity for future growth. The switchboard, located in the company's own building, is arranged to take care of 1500 lines, equipment at present installed for 1000, with 870 jacks filled at the time of a special report to the AMERICAN TELEPHONE JOURNAL a few weeks ago.

A large amount of aerial cable is installed, as shown by the following approximate figures: 6900 ft. 150 pair; 6600 ft. 100 pair; 1000 ft. 75 pair; 4500 ft. 50 pair. The extent of the plant is further indicated by the figures showing that the company has in its exchange district 400 poles, 205 miles aerial wire in local lines and 152 miles aerial wire in toll lines.

During the past year the growth of the business at the Warsaw exchange required an addition of 200 lines to the switchboard with a substantial increase in the cable plant. Subscribers' stations added were all on direct lines, 27 being for business and 96 for residence service. At the present time the company is completely overhauling all the plant and installing 6400 ft. of various sizes of cable, necessary cable terminals and auxiliary appliances. The completion of this work will leave practically nothing of the original plant in service, so that all equipment will be adapted to give subscribers the best possible service with almost absolute freedom from interruption; while the company will benefit by the reduction of maintenance expenses to the lowest possible figure.

The financial results of the operation of this company have been satisfactory. It has $50,000 capital authorized, all in common stock. There is no preferred stock and no bonds or obligations of any kind, the company being entirely out of debt. At its rates of $2 and $1.50 for business and residence service, respectively, over direct lines and $1.25 per month for a two-party residence service, the company has been able to pay regular quarterly dividends of 1½ per cent, maintain a depreciation fund and build up a substantial reserve balance.

The stock of this company is owned by 19 people, 16 of whom have been holders for the past eight years, and there is no stock for sale.

This company also controls exchanges in Noble County located at Albion, the county seat, and at Kimmel. The Albion exchange was almost entirely rebuilt last year, and the Kimmel exchange was built new throughout last year. At the county seat office there is a switchboard having three local and one rural line position giving service to 600 subscribers. The central office in Kimmel has 150 subscribers.

Toll connections from the Warsaw exchange are obtained over the Commercial Telephone Company's own lines to several neighboring towns and cities, while four outside Independent companies own lines entering this office, so that ample facilities are given to subscribers for talking with other Independent exchanges in Indiana and neighboring States.

Brantford's Memorial Monument to Alexander Graham Bell

The people of Brantford, Ont., have just finished raising the sum of $40,000 for a memorial to Prof. Alexander Graham Bell. It was just outside of the city that Prof. Bell made his first successful experiments with the telephone, and Brantford has ever since been known as the "Telephone City." With this money subscribed several blocks of land in the center of the city have been purchased and will be turned into public parks. In addition a monument will be erected to perpetuate the name of the inventor. All this has been done by a little city with a population of barely 20,000 souls. A few days ago Prof. Bell visited the city and the Brantford *Expositor* took advantage of the occasion to make the following excerpt from its issue of Aug. 11, 1876:

"Friday night a number of gentlemen from town were the guests of Prof. A. Melville Bell at his beautiful home at Tutela Heights. The object of the gathering, besides the enjoyment of the large-hearted hospitality of the host, was for the purpose of meeting E. S. Symons, Esq., Under Secretary of the Colony of Victoria, the brother-in-law of Prof. Bell. Among the guests were Prof. D. C. Bell, Prof. A. Graham Bell, of Boston; Sheriff Smith, Principal Hunter, of the Blind Institution; A. Robertson, Esq., manager of Montreal Bank, William Patterson, Esq., James Wilkes, Esq., A. J. Wilkes, Esq., F. B. Fitch, Esq., W. H. C. Kerr, Esq., Dr. Corson, Henry R. Corson, Esq., of Markham, Ont.; Dr. Digby, Dr. Philip, J. T. Gilkinson, Esq., and William Watt, Esq. * * * A rare treat was afforded the guests in the experimental explanation made by Prof. A. Graham Bell, of Boston, of the new system of telephony lately invented by him. Instruments were placed, one in the porch of the residence and the other in an outhouse in the grounds, and communication made between these with 10 miles of wire. Musical notes, the human voice, songs, spoken and sung before one instrument were plainly audible by placing the ear to the instrument at the other end.

"On Thursday Prof. Bell had communication made with his instrument on the common telegraph wire between Brantford and Mount Pleasant, a distance of five miles, and was spoken to while in Mount Pleasant with Prof. D. C. Bell and Mr. Griffen from the Dominion office at Brantford. Last evening the professor tried a different experiment so that three persons could sing different tunes or different parts of the same tune into the instrument at the same time. The trial was perfectly successful, the different voices coming distinctly over the wire at the same time so that they could be separately distinguished by the listener. After the experiments a banquet was served and speeches made by a number of those present."

Controversy Over Messenger Service in Ohio

Complaints have been made to the effect that the Bell telephone people have refused to deliver messages to persons who have taken the service of the Citizens' Telephone Company in Clermont County. It seems that the Bell companies had been accustomed to taking messages at their offices and delivering them to persons within a reasonable distance, much the same as telegraph companies do, and presumably for a reasonable fee. Since competition has become sharp, the companies have ceased to furnish this service to persons who have put the competing service in their homes or business places, and the people believe they have a grievance as a result. This is, however, one of the features of competition, whether it does the company any good or not. The complaint on the part of the people is perhaps due to the custom that was inaugurated, rather than to any right they have to ask the company to continue the service.

Telephone Service on Moving Train

During the recent 2000-mile trip of the Omaha Commercial Club through the Northwest every one of the 100 members was continuously in connection by telephone with every other member, with the club steward and with the buffet and dining cars and the barber.

The excursion was taken on a special Burlington train of nine cars and an engine; one baggage car, one tourist car, two diners, two standard sleepers, two 10-stateroom compartment cars and an observation car.

Twenty-eight telephones were installed, one in each car, baggage, tourist and two diners and the observation compartment. In addition a telephone was placed in each private stateroom and drawing room, 21 in number. The switchboard and oper-

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ator were located in one of the smoking compartments and in no way interfered with the normal use of the compartment.

The instruments were all of the hand-set type, so as to avoid the noise from the jar of the train.

The junctions between all cars were made with plugs and jacks, so that they could be made and broken at a moment's notice. The train was entirely uncoupled several times.

At every station drops were connected with the switchboard from the local exchange and service was given the party to its friends in town and over long distance lines back home.

This service was furnished by the Nebraska Telephone Company. Telephone service of the same sort has been given on each of three previous excursions of the club. It has never, however, been on such a complete or elaborate scale.

New Connection Contract for the American Union

The Bethel & Mount Etna Telephone Company was recently granted a charter to do business in Lebanon and Berks Counties, Pennsylvania. This organization is now in a position to appreciate the benefits resulting from competition in long distance service, as it has for some time been an object of interest both to the Bell organization and to the American Union company. At first the Bell company appeared to have the lead, but as a result of the efficient work of Mr. William P. Beardsley, the traffic manager of the American Union company, and Mr. Paul R. Laudermilch, the division manager of that organization at Lebanon, the new company now connects with the American Union lines. The Bethel & Mount Etna company has already established an exchange completely equipped at Freystown and contemplates building four more, located at Bethel, Mount Etna, Womelsdorf and Stouchburg, respectively. In the neighborhood of 75 instruments are now working, and the officers expect to have about 400 installed by the first of September.

The American Express Company's Indiana Telephone Service

Representatives of Indiana Independent telephone companies were amused and not at all pleased on learning of the receipt of a telegram by Mr. Theodore Thorward referring to the use of Independent telephones by the American Express Company. This telegram was from Mr. L. W. Fargo, vice-president and general manager of the express company, and the telephone men objected to the suggestion that they should furnish the company service free.

The text of the telegram is reported as follows:

"The American Express Company found it necessary in various ways to economize, and among the instructions issued agents where the instruments of two or more companies were employed, were directions to select and retain the telephone service most valuable to the company from point of view of express patronage.

"Agents were specially instructed to select the telephone to be retained on no other basis, and under no consideration to discriminate against the Home companies, for obvious business reasons, which will be entirely clear to you. We have retained many local telephones and have discontinued many Bell telephones accordingly. We shall be very glad to resume using the telephones of the Home companies where they have been discontinued, for your convenience and if free of cost to this company. This telegram is sent to correct the wrong impression which you evidently have in regard to our attitude."

About 30 telephone men at a meeting of the first district of the Indiana Independent Telephone Association had passed a resolution in which a protest was entered against the express company's attitude before the receipt of the telegram. The resolution reads as follows:

"At a meeting of the First District Independent Telephone Association, held in the office of the Home Telephone Company, of South Bend, it was reported that the American Express Company had issued an order excluding all Independent telephones from its offices throughout Indiana.

"As this is a clear case of discrimination in favor of the Bell service, with no reason for the discrimination being given, and as it is against public policy and the public convenience, for the reason that the Independent patrons number three to one of the Bell throughout the State, thereby depriving the greater number of telephone patrons of the State and thereby excluding them from the convenience afforded by means of the Independent facilities of reaching the American Express Company, we, therefore, enter our vigorous protest against such unreasonable and unwarranted business methods on the part of the American Express Company."

The action of the express company was one of the principal topics discussed, although toll line matters received considerable attention. Action was taken looking toward even better toll line facilities than at present afforded. Another matter of interest was an inspection of the new directory of the local company, which revealed a total of 6500 subscribers in the 10 different exchanges listed and a very remarkable growth in the six years the company has been in business.

Meetings of the Oklahoma "Boosters' Club"

Employees of the Pioneer Telephone & Telegraph Company, of Oklahoma, are, through their recently organized "Boosters' Club," doing much to advance their knowledge of the business and by their better co-operation are obtaining good results for the company.

Among the meetings which have been held was one at the Sallisaw exchange at which delegates were present from the Webber Falls, Muldion, Westville, Bokosha and Spiro exchanges. A school was formed and the following subjects discussed: Collections, auditing, operating and maintenance. Another district meeting held at McAlester brought out about 40 members coming from Wilburton, Hartshorn, Enfald and Crowder City.

Mr. P. K. Higgins, the general superintendent of the company, presided at the meeting. Among the papers read was one on "Our Influence on Collections," by Miss Rose Gist, an operator, and another on "System in the Telephone Business," by Mr. Harry Lyons. Miss Gist also presented a paper bearing the title "How We Can Help the Collector and Bookkeeper." Addresses were made by C. B. Luck, Mr. Pennyfield and Mr. J. S. Brook, of Oklahoma City.

Telephone Traps Taft

Managers interested in government policies have received a pointer on a sure way to win the favor of the Republican Presidential candidate—simply look to the size of their booths. Reports from Hot Springs, Va., announce that Mr. Taft hurried to a pay station in an ordinary booth to answer a call and with difficulty reached the telephone. When through talking he found that he was stuck fast and could not wriggle out. The hotel carpenter freed him by sawing out the door. Now they are furnishing him a special booth—adding another testimonial to "The Bigness of Big Bill."

New Organization for New England (Bell) Company

As a result of the ideas which are now being worked out and applied to the organization of Bell companies, important changes in the operating departments of the New England Telephone & Telegraph Company (Bell) go into effect on Aug. 1.

Three divisions will be created under the names of the commercial, traffic and plant departments, a fourth division, the engineering department, remaining substantially as at present.

The commercial department will deal with the development of revenues, recommendations for changes in established rates, the making of service contracts, collections, advertising, the investigation of service through trial and especially through invitation to patrons to comment thereon; investigations and recommendations arising from complaints of service not appropriately disposed of by the traffic or plant departments; competition, adjustment of claims, and relations with municipalities.

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The plant department will handle the construction, reconstruction and maintenance of plant, buildings, equipment and central offices; the origination of recommendations for ordinary and normal plant additions and extensions, and current reconstruction and maintenance; the handling of routine rights of way, especially through private property; and the handling of service complaints and equipment defects so far as appropriate for the prompt remedy of defects and restoration of service.

The traffic department will handle the operation of plant and equipment for furnishing service to subscribers and customers, including the development of service quality and methods; the originating of recommendations for the improvement of service, and the handling of service complaints that cannot be disposed of more appropriately by other departments.

The engineering department will act in a capacity advisory to the general manager; will pass on all estimates for work on plant and equipment; will furnish necessary plans and specifications for plant, buildings and equipment; will prescribe the general construction methods and methods of doing work, and will advise the general manager of requirements for any extensive additions or changes in plant or equipment. It will also advise as to methods of operating where they affect or are affected by type of apparatus and equipment.

Territorial administration will be strengthened by assigning more authority to certain officials connected with each department, who will remain in the district under their control. The following appointments have been made:

Commercial Department.—General superintendent, C. T. Keller, formerly assistant general manager; superintendent contract and revenue department, F. C. Munroe, formerly superintendent contract department; superintendent directory and printing department, G. G. S. Perkins, formerly superintendent catalog and printing; superintendent advertising department, T. J. Feeney, formerly advertising manager; superintendent Boston and Southern Massachusetts Division, J. H. Barry, formerly superintendent Central Division; superintendent Western Division, F. G. Daboll (unchanged); superintendent Central Division, T. E. Parker, formerly superintendent Southern Massachusetts Division; superintendent Eastern Division, C. H. Adams (unchanged).

Plant Department.—General superintendent, G. H. Dresser, formerly general superintendent; assistant general superintendent, T. O. Wright, formerly superintendent Boston Division: Boston and Southern Massachusetts Division, in charge of assistant general superintendent; superintendent Western Division, R. H. Keller, formerly division engineer, Eastern Division; superintendent Central Division, H. A. McCoy, formerly engineer, Central Division; superintendent Eastern Division, D. B. Small, formerly district superintendent, Manchester, N. H.

Traffic Department.—General superintendent, F. P. Valentine, formerly engineer of traffic; general supervisor of traffic, J. C. T. Baldwin, formerly with American Telephone & Telegraph Company; traffic engineer, B. J. Bowen, formerly with engineer of traffic; superintendent Boston and Southern Massachusetts Division, H. E. Farnham, formerly Boston traffic manager; superintendent Western Division, G. W. Hayden, formerly Boston traffic division; superintendent Central Division, R. A. Nickerson, formerly with engineer of traffic; and superintendent Eastern Division, L. C. Whitcher, formerly with engineer of traffic.

Engineering Department.—Engineer, G. K. Manson, formerly assistant chief engineer.

Addition to List of International Association Stamp Users

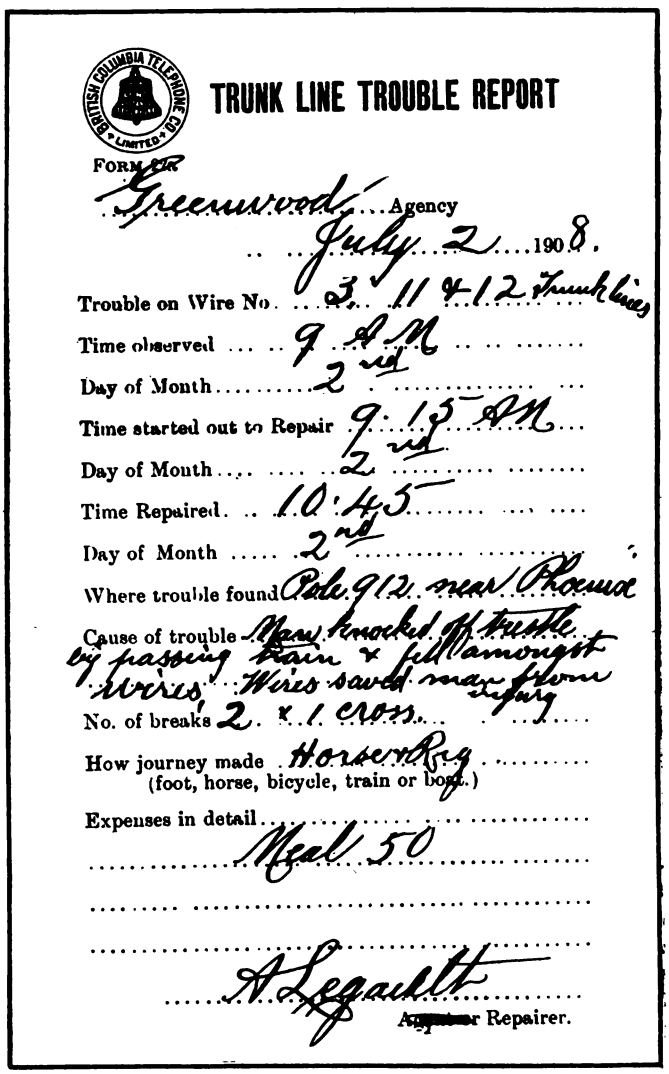
The officers of the International Independent Telephone Association have announced that the Homer-Roberts Telephone Company, 1703 Melrose Street, Chicago, Ill., has agreed to use the stamps on its invoices.

Companies retaining the list published in our issue of May 16 are requested to add the name of this company to list No. 3. The name of the American Electric Works, Chicago, Ill.; New York, N. Y., and Phillipsdale, R. I., should be added to list No. 2, published in the same issue, of the companies in whose favor the stamp resolution is waived.

Peculiar Cases of Trouble

In your issue of June 13 I noticed an article on a case of trouble caused by a hawk. Upon two occasions our repairer has had cases of trouble which were similar, except that they were caused by grouse, which he brought home with him and had for his dinner.

The West Kootenay Power & Light Co., which operates high-tension lines at 60,000 volts through the Kootenay country



BRITISH COLUMBIA TELEPHONE CO. LIMITED

TRUNK LINE TROUBLE REPORT

FORM

Greenwood Agency

July 2 1908.

Trouble on Wire No. 3, 11 & 12 Trunk lines

Time observed 9 AM

Day of Month 2nd

Time started out to Repair 9:15 AM

Day of Month 2nd

Time Repaired 10:45

Day of Month 2nd

Where trouble found Pole 912 near Phoenix

Cause of trouble Man knocked off trestle by passing train & fell amongst wires. Wires saved man from injury

No. of breaks 2 & 1 cross

How journey made Horse & Rig (foot, horse, bicycle, train or boat.)

Expenses in detail Meal 50

A Legault

~~Agent~~ Repairer.

Trouble Report Sent in to Telephone Company in British Columbia.

has upon three occasions had short-circuits, and consequent breaking of wires, owing to owls flying into the lines. The wings of the owls made contact with two sides of the circuit, formning an arc, and the resultant burns opened the circuit.

I also send you one of our trouble cards, showing a case where a man was knocked off the railway trestle by a passing train, and fell among a lead of wires, which saved him from injury, as the distance from the top of the trestle to the ground is about 50 ft.

G. C. HODGE.

Unsportsmanlike Fishermen Trapped by Telephone

All good fishermen who are telephone men, and all good telephone men who are also fishermen rejoice at the part the telephone has played in bringing up with a sharp turn three Columbus men. These men were arrested by Deputy Wardens L. H. Bradfield and U. M. Cook, assisted by Marshal George Andrus and Constable James Roberts, for dynamiting for fish in Big Walnut, near Central College, Ohio.

W. H. Osborn discovered the men dynamiting a stream on his

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farm, and when he could not get the local police to arrest them, he sent in a call to Chief Game Warden Speaks, who sent his deputies in an automobile to make the arrest. The appropriate conjunction of a rural telephone having long distance connections over the wires of the Columbus Citizens' Telephone Company with State Game Warden Speaks made an unavoidable trap for the men fishing by illegal methods.

New Telephone System in University of New Mexico

Students in the electrical department of the University of New Mexico, at Albuquerque, N. M., have recently set up a switchboard and telephones, which were presented to them. A certain amount of practical instruction in telephone work will hereafter be given at the university.

Nebraska Rural Telephone Company Raises Rates

On June 29 the State Railway Commission of Nebraska authorized the Humboldt Telephone Company to raise its rates from 75 cents to $1 per month. Experience with the low rates, which represent a reduction from an original figure of $1 per month, soon showed the company that they were unremunerative. This company operates in rural territory.

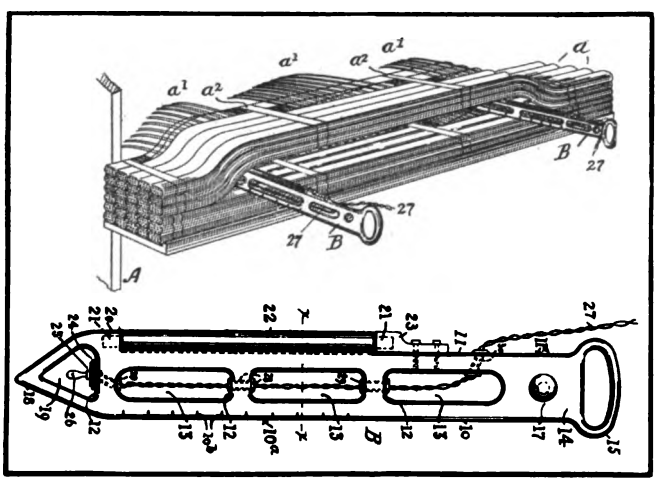
Telephone Patents

MULTIPLE CABLE RAISING OR SEPARATING DEVICE.

Andrew G. Gillespie and Wm. E. Potter, Chicago, Ill., patent 893,319, July 14, 1908.

This patent covers a device for separating the layers of multiple cables in a switchboard when it is desired to inspect or remove the jacks.

The device consists of a bar B of the shape shown in the illustration. Near the handle 15, a turning bar or lever 17 is



loosely fitted. A roll 22 is attached to one side of the bar, its diameter being the same as the thickness of the bar. The length of the roll is as great as that of the widest layer of cables. The side of the bar opposite the roll 22 is marked with a scale 10*b* by which the extent of insertion of the device can be judged.

Provision is made for an incandescent lamp 26, the conductors for which pass through the bushed holes 28, 29 and 30.

The tool is inserted between the layers of cable and then turned on edge 10*a* as an axis, while the roll 22 runs under the overlying layer.

TELEPHONE CABINET.

Wm. B. Altick, Lancaster, Pa., patent 893,219, July 14, 1908.

This patent covers improvements in sound-proof telephone booths. A booth or cabinet practically rectangular in form, having three closed sides with top and bottom plates, is opened or closed by means of a semi-cylindrical body supported on rollers.

TELEPHONE REPEATER SYSTEM.

Nathaniel G. Warth, Columbus, Ohio, patent 894,170, July 21, 1908.

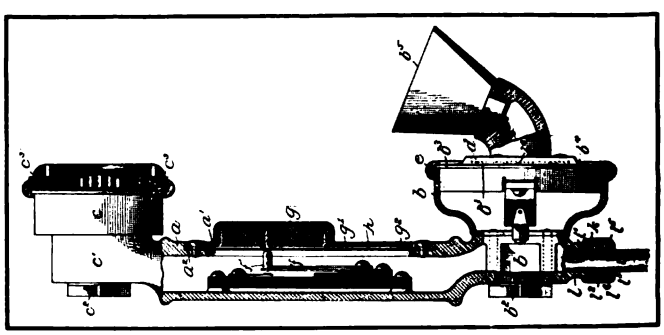
This invention relates to repeater circuits. The lines from two widely separated telephone stations are terminated at a repeater station. This station includes: Two local or primary circuits, one for each line circuit, with a repeating or induction coil inductively uniting them to their respective line circuits; telephone repeaters in each local circuit associated with its respective line circuit so that its transmitter operates through its local circuit and coil to induce its retransmitting current into the line circuit. Each repeater is inductively responsive to currents originated in its line circuit and irresponsive to currents produced by it in the other line circuits. Local or self-action, causing howling in the repeaters, is prevented by means of an electrical balance produced by using divided windings for the repeater receiver.

HAND TELEPHONE SET.

Geo. F. Atwood, East Orange, N. J., patent 893,891, July 21, 1908.

A waterproof hand telephone set adapted for severe outdoor use is covered by this patent.

The set is made up of hollow handle *a* carrying a waterproof transmitter *b* at one end and a waterproof receiver *c* at the other end. The hollow handle *a* contains the switch spring terminals *f* which, in service, control the local circuit of the transmitter. These terminals are operated by a plunger or depressor bar *g* projecting through the opening *a'* in the case and engaging pin *f'* carried by one of the terminals *f*. A spring *g'* restores the plunger *g* after it has been depressed. A thin waterproof lining or cover *h* is placed over the opening *a'* and is held in place by the plate g^3 and seat a^2. The conductor cord *i* passes into the set through an opening *k* in the end of the handle. This opening is sealed and made watertight by a



stuffing box *l*, which also serves to hold the cord in place, preventing strain from coming upon the terminals of the cord conductor within the handle.

TELEPHONE RELAY.

Charles W. Underwood, Crowley, La., patent 893,953, July 21, 1908.

In the device described there are provided two receiving elements, each similar to the ordinary telephonic receiver except that the diaphragms are replaced by light armatures. These armatures are supported in a centralized position with relation to the respective receivers by means of tightly stretched wires or thin bands. The receivers are placed with their polar ends

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facing each other and the armatures are connected to opposite sides of a transmitter element or elements in multiple, the point of connection from each armature being at that side of the transmitter remote from the receiver.

INTERCOMMUNICATING TELEPHONES.

H. C. Thomson, Boston, Mass., patent 893,820, July 21, 1908.

In this invention the junction box, commonly employed in connection with intercommunicating telephones, is eliminated. To avoid the use of the junction box, a series of metal plates corresponding to the number of main conductor wires in the line cables, is placed on the backboard of each telephone set.

RINGER.

Elbert R. Hobbs, Lamar, Col., patent 12,828, reissued July 7, 1908, original patent 809,060.

This invention covers a telephone ringer, the feature of which is a plate supporting the armature, springs and adjusting mechanism. The armature is supported in such a position that it cannot "stick" to either of the magnetic coils.

In the Manufacturing Field

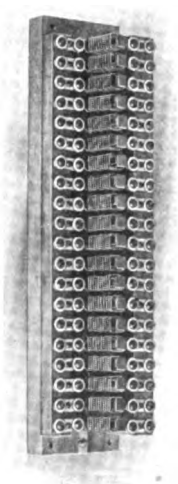
A New "Multi-Discharge" Arrester

The Sumter Telephone Manufacturing Company has recently placed on the market a new type of its well-known multi-discharge lightning arrester which is adapted for use in pole boxes and with small switchboards.

The engineers of this company have reached the conclusion that circular coils in lightning arresters have little or no efficiency, but that each turn of the coil should contain several abrupt bends. This type arrester is, therefore, so constructed that there are four abrupt bends or angles for each turn of the coil. The grounding medium is put inside of the coil, but is insulated therefrom by suitable strips of mica and, owing to the accurate formation of the coil and the careful adjustment of the carbon block, a very minute air-gap is obtained, thus greatly increasing the efficiency of the device.

No fuses are required for the protection of the apparatus from lightning discharges alone, nor is there any danger of the arrester becoming grounded from carbon dust. The peculiar feature of this arrester is the fact that it is necessary for all of the lightning current to pass through the coils before the lightning can get into the telephone instrument. This is in contradistinction to the ordinary carbon block arrester, all types of which only afford a side path to ground. Lightning seems to possess a certain inertia or momentum which often carries sufficient current by the ordinary carbon block type of arrester to go into the telephone instrument and severely damage it.

The arrester is very small, thus rendering it adaptable for



The Sumter Multi-Discharge Lightning Arrester.

cable box use. Machine screw terminals are provided for connecting the incoming bridle and cable wires.

The arresters are built in units of 10 pairs each, and these units are readily joined together in either a horizontal or vertical position by connecting the various ground strips together by a short piece of heavy wire.

To place the arrester in service it is simply necessary to place each coil in series with one side of the incoming line. It does not matter which side of the arrester the lines are connected to, these connections being made in the most convenient manner.

The manufacturers guarantee apparatus against damage from lightning for a period of one year when this arrester is used.

This "multi-discharge" arrester has been sold in large quantities to the United States government, which is now using over 25,000 of them.

A New Box for Dry Batteries

The "Paragon" battery box is designed to protect dry batteries in service. It keeps the cells free from dust and dirt, and prevents loose connections and breakage of the carbons, troubles frequently experienced when the batteries are set up loose in

The Paragon Battery Box.

locations where they are exposed to contact with moving objects and likely to be knocked over.

The box is the right size to hold two No. 6 dry cells. It is made of sheet steel, being finished in black Japan and lined throughout with heavy insulating fiber which protects the sides of the box and the holes through which connecting wires are led. The cover is not hinged, but is attached to the box by a nickel-plated chain. This battery box is now for sale by all telephone manufacturers, jobbers and dealers in electrical supplies. It is manufactured by F. W. Pardee, 60 Fifth Avenue, Chicago.

THE F. BISSELL COMPANY, of Toledo, Ohio, dealers in telephone supplies, have issued an interesting calendar card for the month of August. The company calls attention to its steady increase in patronage, and attributes this constant increase to the prompt attention given to all orders received, its large stocks, quick shipments and reasonable prices. These combined qualities cause the purchaser of to-day to become the permanent customer of to-morrow, and the Bissell company states its readiness to be given an opportunity to prove this.

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Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

NEW COMPANIES

CARTHAGE, ARK.—The Grant & Dallas County Telephone Company has been organized at this city, and is planning for the installation and operation of an exchange. It has an authorized capital stock of $25,000, and the incorporators are: R. E. Harrison, who has been elected president, T. E. Bell and P. G. Bell.

BLOOMFIELD, IA.—The Bloomfield Telephone Company, whose principal place of business is to be located in this city, has filed articles of incorporation. It has an authorized capital stock of $20,000, and the following officers have been elected: G. E. McFarland, president; C. E. Hall, vice president; W. J. Steckel, secretary and treasurer. Others interested in the enterprise are: E. Palm, F. R. Black, N. T. Guernsey and Herbert King. The new company takes over the old plant of the Davis County Telephone Company, which has been in the hands of a receiver, and contemplates the expenditure of several thousand dollars in repairs and new equipment.

AMERICUS, KAS.—The Americus Mutual Telephone Company, which has an authorized capital stock of $10,000, has filed articles of incorporation, and contemplates the construction and operation of telephone lines.

REPUBLIC, KAS.—Articles of incorporation have been filed by the Citizens' Telephone Company, which intends to install an up-to-date telephone system at Republic. The new concern is capitalized at $10,000.

GLENDEANE, KY.—The Taylor Creek Telephone Company has been organized at Taylor Creek and expects to at once commence the construction of a telephone line from that place to Glendeane, a distance of about 22 miles. Among those responsible for the formation of the new company, which is capitalized at $1,000, are D. J. Gayle, M. B. Gayle, Ira Smith, of Taylor Creek, who has been elected manager of the company, and others.

LOUISVILLE, KY.—Announcement is made at this city of the incorporation of the Mulberry Flat Telephone Company, whose purpose is to install and operate an Independent telephone system in Mulberry Flat. The capital stock is given at $2,500, and among the incorporators are: W. W. Taylor, T. H. Rhodes, C. M. Kelley and others. Construction work is to be commenced within 60 days. Address W. W. Taylor, who has been made manager of the company, Mulberry Flat, Ky.

LANSING, MICH.—Articles of incorporation have been filed in Michigan by the United States Telephone Company, a $5,000,000 corporation of Cleveland. This concern now has a line from Toledo to Detroit and Saginaw, but has no office in the State. At the solicitation of the Secretary of State's department, incorporation papers have at last been filed, a franchise fee of $50,000, which the company states covers its investment in the State of Michigan, having been paid.

WALLED LAKE, MICH.—Articles of incorporation have been filed by the Walled Lake Home Telephone Company, and the following officers and directors elected: President, George Dickerson; secretary, George Tuttle; treasurer, A. J. Church; directors, George Dickerson, Amos Bentley, Ira Compton, J. A. Devereaux and Isaac Welch. The company is planning for the construction and operation of an up-to-date telephone system at Walled Lake.

DICKENS, NEB.—The North Platte & Dickens Telephone Company, which has an authorized capital stock of $5,000, has filed articles of incorporation with the county clerk.

ST. PARIS, OHIO.—Among the latest companies to file incorporation papers is the Farmers' & Merchants' Telephone Company, which expects to construct and operate telephone lines in St. Paris and the surrounding country. It has a capital stock of $15,000, and the incorporators are John E. McMowan and others.

DEPEW, OKLA.—Among the latest companies to file incorporation papers is the Depew Telephone Company. It is capitalized at $6,000, and among those responsible for its formation are: M. Pate, J. S. Crall and others.

GRACEMONT, OKLA.—Articles of incorporation have been filed by the Gracemont & Coger Telephone Company. The capital stock is placed at $2,000, and the following directors have been elected: Cryde Dannold, J. S. Cline, A. Flanigan, M. O. Nation, W. H. Higgins, all of Gracemont.

HOLLIS, OKLA.—The Hollis-McKnight Telephone Company has been incorporated, and contemplates the installation and operation of a telephone system in Hollis and throughout Greer County. It has an authorized capital stock of $3,500, and the directorate is composed of: J. B. Moore, T. J. Stewart, M. A. Barnum, John Scott, W. C. Wynn, all of Hollis, and R. H. Holland, of Sandy.

OKLAHOMA CITY, OKLA.—Articles of incorporation have been filed by the Pioneer Telephone Company, which contemplates the construction and operation of a telephone system in this city. Its capital stock is placed at $25,000, and the following directors have been elected: W. A. Lovejoy, E. P. Spears and N. S. Sherwood, all of Oklahoma.

PEEK, OKLA.—The Hackberry Telephone Company has been incorporated with a capital stock of $5,000, and expects to construct and operate a telephone system in this city. It has an authorized capital stock of $5,000, and among the incorporators are D. M. Davis, D. E. Glaney and J. C. Pierce, of Arnett; H. M. Conner, of Peek, and S. T. Lawrence, of Reason.

QUINLAN, OKLA.—Articles of incorporation have been filed by the Enterprise Telephone Company, whose purpose is to construct and operate telephone lines. Its capital stock is given at $1,600, and among the incorporators are: O. A. Dauphin, John Holloway, Al Kelso, G. A. Tefft, of Curtis; A. Washburn, J. J. Hall and P. W. Nickerson, of Quinlan.

HARRISBURG, PA.—The Gilbrook Telephone & Telegraph Company has filed articles of incorporation with the Secretary of State, and Frederick Gilbert, of Knoxville, Pa., has been elected treasurer. The new concern is capitalized at $5,000, and its directorate is made up of: H. P. Gilbert, of New York City; Elroy A. Westbrook, Frederick Gilbert, Knoxville, Pa.; Joseph Cooper, Little Marsh, Pa.; E. M. Tucker, Westfield, Pa., and G. S. Howland, Westfield Township, Pa.

MIDWAY, PA.—The Midway Mutual Telephone Company, which has an authorized capital stock of $5,000, has filed articles of incorporation, and is planning for the installation and operation of a strictly up-to-date telephone system.

BREMERTON, WASH.—Articles of incorporation have been filed by the Kitsap County Telephone Company, of Bremerton. Its capital stock is given at $5,000, and the incorporators are: Herbert B. Gehr, W. D. Calder, J. W. Potter, Smith E. Reynolds, Edwin P. Dole and others.

MADISON, WIS.—News comes from this city of the incorporation of the McKinley Telephone Company, of McKinley. It is capitalized at $1,500 and among those interested in the new enterprise are: E. J. Pfluger, Anton Lundmark and Oscar Risberg.

MILLTOWN, WIS.—An Independent telephone company, to be known as the Milltown Mutual Telephone Company, has been organized at this city, and expects to install and operate a modern telephone plant. It has a capital stock of $4,000, and among those interested in the new enterprise are: John N. Rahr, Mads Bank, Simon K. Twetten and George E. Peterson.

WAYSIDE, WIS.—Articles of incorporation have been filed by the Wayside Telephone Company, of Wayside, and arrangements are being made for the construction of a telephone system in that city. The company has an authorized capital stock of $2,000, and the incorporators are: Joseph Hoffman, Thomas Monahan and John Matzke.

FRANCHISES

WILLOW, CAL.—The matter of the franchise for the Glenn County Telephone Company is to be held over by the Town Trustees until the first Monday in August. It is stated that a number of representative citizens and business men of this city have signed a petition in favor of the Glenn Company, which offers $1,000 for the franchise if it is granted at once. It is quite probable that the Town Board will be forced to call for bids at its next meeting.

MILLER, IND.—A 25-year franchise has been granted by the town board of Miller to the Northwestern Indiana Telephone Company, whose business is increasing at a very rapid rate.

WICHITA, KAS.—The Independent Telephone Company is again endeavoring to secure an amendment to its franchise which will permit it to increase its charges for telephones in the city. The amended ordinance of the company fixes the charges at not more than $36 per year for offices and business houses; $24 for residences, and not more than $18 per year for residence telephones on party lines, with not more than four telephones on a line. Under the present franchise the rates are $30, $18 and $12 respectively.

LEXINGTON, KY.—The Fayette Home Telephone Company has purchased a 20-year franchise in this city. A new exchange building is to be erected, in which the most modern equipment is to be installed. About $60,000 is to be expended by this company in its proposed work.

PLATTSMOUTH, NEB.—Application has been made at this city by the Nebraska Telephone Company for an amended franchise which will allow it to change its present rates from $3 per month for business telephones to $2.50 per month for business private lines, and from 50 cents per month for residence telephones to $1.50. Should this request be complied with, the Plattsmouth Independent Telephone Company will ask to be allowed to make the same rates.

PENNINGTON, N. J.—At a recent meeting of the Hopewell Township

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Condensed News Reports

Committee it was unanimously decided to grant permission to the Pennington Telephone Company No. 1 to construct lines along a section of the public highway.

ENTERLINE, PA.—An amendment to its charter increasing its capital stock from $5,000 to $50,000 has been filed by the Enterline & Halifax Telephone Company. This company was organized for the purpose of constructing a rural telephone system in Dauphin County, and it is stated that the increase in capital is to be used by it in making extensive improvements and extensions in its plant.

CHATHAM, ONT., CAN.—The Neil Watson's Ridgetown & Hull Telephone Company has applied for permission to install a telephone system in this city.

MUSQUIZ, COAHUILA, MEXICO.—The government of the state of Coahuila has granted a concession to General Geronimo Trevino, of Monterey, for the construction of a telephone line from the town of Musquiz, that state, to La Bahia. It is stated that the work of constructing this new line is soon to be commenced.

FINANCIAL

PASADENA, CAL.—A dividend of ½ of 1 per cent has been declared by the Pasadena Home Telephone Company.

LITTLE CYPRESS, KY.—The capital stock of the recently incorporated Independent telephone company at this city is $1,000.

BOSTON, MASS.—The directors of the New England Telephone & Telegraph Cimpany have declared the regular quarterly dividend of 1½ per cent, payable August 15 to stock of record of July 31.

STANLEY N. Y.—At a recent meeting of the Seneca-Gorham Telephone Company, held at this city recently, its report showed net earnings of 15⅔ per cent on the capital stock, and a dividend of 6 per cent was declared.

BELLEVERNON, PA.—The capital stock of the recently incorporated Westmoreland & Fayette Telephone Company has been increased from $1,000 to $5,000.

CONSTRUCTION

BERRY, ALA.—Plans are being considered by the Home Telephone Company for the installation of an exchange in Berry and the construction of a long distance line from that city to Oakman.

BIRMINGHAM, ALA.—An additional toll line between Birmingham and Tuscaloosa is being erected by the Southern Bell Telephone & Telegraph Company to take care of its increased business in this section.

CROCKETT, CAL.—Arrangements are being made by the Pacific Telephone & Telegraph Company for the installation of a central station at this city, and the establishment of connections with Rodeo, Port Costa, Eckley, Valejo Junction and other points. Considerable new construction work is also being done by this company in Wilmington.

HARMON, ILL.—The lines of the Green River Telephone Company are being extended in Harmon, and into the surrounding country.

PLEASANT PLAINS, ILL.—Many improvements in its system at this city are being made by the Central Union Telephone Company.

ROCKTON, ILL.—Among the extensions being made by the Winnebago County Telephone Company is a line from Harrison to Rockton.

WARSAW, IND.—Arrangements are being made by the Independent telephone companies of Warsaw, Nappanee and South Bend for the construction of an all-copper circuit between the three places.

COUNCIL BLUFFS, IA.—To take care of 1000 new subscribers, additional cables are being installed by the Independent Telephone Company of this city. The company is also at work on a direct line between Council Bluffs and Des Moines, connections now being established through Avoca and Atlantic. The new line will give direct communication with Des Moines over a double copper circuit.

EDDYVILLE, IA.—About 900 ft. of new cable is to be strung by the Eddyville Telephone Company in this city to take care of its increased business.

PERRY, IA.—Work is to be commenced at once in this city on a new exchange building for the Hawkeye Telephone Company. It is the company's intention to equip it with a modern switchboard, and all late improvements. Its entire system is to be rebuilt, and it is estimated that the improvements will cost in the neighborhood of $20,000.

LARNED, KAS.—Very extensive improvements are to be made in the telephone system at this city, which is owned by H. T. Taylor and Dr. Sharp. About 12,000 feet of new cable is to be employed, and the work, which is to be under the direction of Green & Piper, of Kansas City, Kas., is to cost in the neighborhood of $10,000.

COLSON, KY.—The Upper Rockhouse & Beaver Creek Telephone Company is planning for the erection of a line from Colson to Tocsin. Preparations are also being made for the installation of a switchboard on Camp Branch Creek, where connections are to be made with the Whitesburg Telephone Company and the Letcher County Home Telephone Company.

SUTTON, KY.—The Sutton Telephone Company has commenced the construction of a line from this city to Elkhorn Creek, a distance of about 20 miles. Other shorter branches are also to be built. Address J. P. Blanton, Manager.

THREE RIVERS, MICH.—Among the extensions being made by the Southern Michigan Telephone Company in its system is the construction of a line from Three Rivers to Cassopolis.

BEMIDJI, MINN.—It is the intention of the Northwestern Telephone Exchange Company to entirely rebuild its plant at this city.

JACKSON, MISS.—Work is to be resumed by the Cumberland Telephone & Telegraph Company on the construction of its new long distance line between Jackson, Miss., and Memphis, Tenn. Construction work is also to be commenced at an early date on the long distance line through the Gulf and Ship Island territory.

LIBERTY, MO.—The Clay County Telephone Company, which recently obtained a franchise to install an exchange at this city, expects shortly to commence the contsruction of a thoroughly modern telephone system, which will give a strictly up-to-date service.

CULBERTSON, MONT.—Plans are being matured by the Montana Star Telephone Company for the immediate construction of a line between Culbertson and Redstone.

GLENDIVE, MONT.—The exchange of the Hughes Electric Company at this place will be completely rebuilt and in condition to give first-class service after the work under the direction of Stone & Green, of Chicago, Ill., is completed.

HEBRON, NEB.—A new copper metallic line, which will connect Hebron with Lincoln, Omaha and Hastings, is being constructed by the Western Telephone Company of Lincoln.

TROY, N. Y.—The Commercial Union Telephone Company in extending its lines to Warrensburgh, Lake George, Greenwich, and Averill Park. It is also building toll lines to connect with Ticonderoga, Fort Henry, Plattsburgh and other points in northern New York.

UTICA, N. Y.—As soon as practicable, it is the intention of the New York Central Lines to establish a telephone dispatching system over its entire route from New York to Chicago. This system is already in use between Fonda and Albany, and the company now has men at work extending it from Fonda to Little Falls. The next step, it is announced, will be from Little Falls to Utica. The officials of the road have expressed their satisfaction at the successful operation of this method of train despatching.

GREENSBORO, N. C.—Connections between Greensboro and Staley have been established by the Southern Bell Telephone & Telegraph Company, and arrangements are being made to connect with Ore Hill, Pittsboro and other places.

LAWTON, N. D.—A new switchboard is being installed for the Lawton Telephone Company in this place, and the entire system is being overhauled. About 30 miles of rural lines will be built in the vicinity. The work is being done by Johann & Johann, of Pekin, Ill.

ATHENS, OHIO.—A new switchboard is to be installed by the Home Telephone Company at this city, and its plant otherwise materially improved.

BOWLING GREEN, OHIO.—It is the intention of the LeMoyne Telephon Company, of LeMoyne, to install an exchange at Bowling Green, its capital having been recently increased for this purpose. The company is also planning to build a considerable number of new lines during the early fall.

JUNCTION CITY, ORE.—The Pacific Telephone & Telegraph Company expects to entirely rebuild its plant at this city.

BELLEFONTE, PA.—The American Union Telephone Company is about to install a common battery system in its exchange at Bellefonte, Centre Co., Pa. This will necessitate a reconstruction of all its lines running into that exchange, and will be of immediate benefit to the locality, not only for better service, but in a financial way. The exchange is now equipped with the magneto system.

NEW MILFORD, PA.—The lines of the Northeastern Telephone Company are being extended from New Milford to the Highlands.

ORWIGSBURG, PA.—A new exchange has been installed in this city by the Bell Telephone Company of Pennsylvania.

AURORA, S. D.—The Trenton Mutual Telephone Company, having refused the offer made by Messrs. Thompson, Caldwell and Wilson, of Brookings, for the purchase of its line, has voted an assessment on its stock, and will at once commence the overhauling and improvement of its system.

DE SMET, S. D.—Lines south and west of the city are being constructed by the De Smet South Western Telephone Company.

MOBRIDGE, S. D.—It is the intention of the South Dakota Telephone Company to install an exchange in this place.

ONIDA, S. D.—The manager of the Great Western Telephone Company, F. B. Rowe, is planning for some new construction work in Onida and vicinity. Among the improvements will be a copper line to Pierre direct from Onida, and a telegraph rate of 25 cents will be charged for messages to the Western Union connection at Pierre. Manager Rowe expects to build 500 miles of new line before the close of the season, and will make Onida one of the principal offices.

WINNIPEG, MAN., CAN.—Work is in progress in different parts of the Province on about 300 miles of toll line, which are being built by Stone & Green, of Chicago, Ill.

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Condensed News Reports

ELECTIONS

JACKSON, MICH.—At its recent annual meeting the Citizens' Telephone Company elected the following officers: President, J. C. Richardson; vice-president, E. W. Barber; secretary and treasurer, E. B. Fisher; general manager, C. E. Tarte; local manager C. R. Kehoe.

LEBANON, MO.—The Laclede County Co-operative Telephone Association is having excellent success in the operation of its system, having recently installed a new switchboard. The directors of this company are M. D. Johnson, Russ, Mo.; U. E. Pool, H. W. Bowman, O. L. Fullbright, Tom Giliner, Lebanon, Mo.; J. M. O'Quinn, B. C. Hooper, Sleeper, Mo. The officers are M. D. Johnson, president; H. W. Bowman, secretary;, and O. L. Fullbright, manager. Mr. Fullbright is a telephone man of all-around experience, the firm of O. L. Fullbright & Company being in the business of building magneto exchanges for other telephone companies.

JAMESTOWN, N. Y.—The Home Telephone Company at its recent annual meeting elected the following officers: President, Arthur C. Wade; vice-president, William J. Maddox; treasurer, B. D. Phillips; secretary and general manager, John H. Wright.

SODUS, N. Y.—The following officers and directors have been elected by the Wayne County Telephone Company: President, Charles A. Lux; vice-president, George F. Waters; secretary, Dr. Towlerton; executive committee, Charles A. Lux, Albert Yeomans and Frank D. Gaylord; directors, C. A. Lux, of Syracuse; Geo. F. Waters, of Pultneyvilie; Ledyard S. Cuyler, of Lyons; Albert Yeomans, of Walworth, Frank D. Gaylord, of Sodus, and Dr. Towlerton, of Lyons.

STANLEY, N. Y.—The officers and directors elected by the Seneca-Gorham Telephone Company at a meeting held at this city are: President, John A. Driscoll; vice-president, Duncan B. Allen; secretary and manager, Rice McCauley; chairman, William Pulver; directors, T. B. Wilson, A. D. Allen and E. E. Hall.

CANTON, OHIO.—The following officers have been elected by the Canton Telephone Seal & Lock Company: President, Edward Hill; vice-president, Frank E. Philippi; secretary, J. B. Snyder; treasurer, Edward Rommell. The above officers, with William Metzger, constitute the board of directors.

PLANKINTON, S. D.—At the annual meeting of the Pleasant Lake Telephone Company the following officers were elected for the coming year: President, John Yeadicke; secretary, C. W. Roberts; treasurer, O. G. Miller. John Caesar and Chris. Childhauser were appointed to act with the officers as an executive board.

YANKTON, S. D.—The following officers have been elected by the Yankton Telephone Company: President, Fred Schnauber; vice-president, R. H. Jones; secretary, F. L. Van Tassel; treasurer, W. H. Edmunds. The directorate is made up of the above named officers and C. H. Dillon, M. P. Ohlman and C. J. Novotny.

MISCELLANEOUS

LOS ANGELES, CAL.—It is reported that a syndicate of Americans, headed by E. H. Huntington, of Los Angeles, Cal., is arranging to install telephone exchanges in a number of towns in the western part of Mexico, and to connect the towns of that region with long distance lines.

LOS ANGELES, CAL.—A formal proposal to install the police signal system, and maintain it for three years, has been submitted to the City Council by the Home Tel. & Teleg. Company. It is as follows: For $18,000 the telephone company will distribute throughout the entire residence district 100 boxes and maintain, without extra expense, the system for three years, the money to be paid in 36 monthly installments of $500 each. At the expiraiton of three years the city may have the right to renew for three years longer on the same terms, but if it is decided to discontinue the system the city is to pay the telephone company one-half the actual cost of construction of the system, and all poles, wires and other material are to be retained by the company. It is also stipulated that the Home Tel. & Teleg. Company shall have the exclusive right to operate the system.

SAN DIEGO, CAL.—A deal has recently been consummated whereby the Home Telephone Company of San Diego passes into the possession of an Eastern syndicate. It is stated that negotiations were conducted through Louis J. Wilde, president of the American National Bank of this city, and that the purchase price was $120,000. The new owners are planning for the construction of a line to all points in the Imperial Valley.

CHICAGO, ILL.—Arrangements are being made by the Chicago Telephone Company to take over the Zion City telephone system, which has been operated as a private affair, the franchise being in Dowie's name. A franchise has been voted to the Chicago Telephone Company, by which it is to expend $4,000 in improvements now and $22,000 later on.

LAWRENCEBURG, KY.—The principal place of business of the newly organized Blue Bell Telephone Company is to be at Lawrenceburg, Ky.

BALTIMORE, MD.—A deed has been filed at Towson by which the Baltimore & Belair Telephone Company transfers its property and franchise to the Chesapeake & Potomac Telephone Company for a nominal consideration of $5.

BALTIMORE, MD.—Considerable damage was done to the lines of the Maryland Telephone Company during a recent storm at this city. It is estimated that thousands of dollars will have to be expended to put them in first-class condition again.

HILLSDALE, MICH.—Plans are being discussed by the owners of the Everybody's Line of Litchfield, and the Southern Michigan or Himebaugh Line of Burr Oak, for a consolidation of the two systems. The Southern Michigan Company has a number of exchanges in operation and, it is stated, is planning for the installation of an up-to date system in Hillsdale.

ALBANY, N. Y.—One of the worst electrical storms of the season reached Albany shortly after 1 o'clock on the afternoon of July 12. Although of comparatively short duration, it caused considerable damage to telephone and other electrical service. Fuses on many telephones in the residential sections were blown out, and for a day or two repair men were kept very busy putting the connections again in good order.

LIMA, OHIO.—Consul-General Herman R. Dietrich, of Guayaquil, reports that on April 11, W. L. Russell, an American citizen of Lima, Ohio, entered into a contract with the Government of Ecuador to establish a first-class telephone service between Quito and Guayaquil and intermediate towns and villages. Mr. Dietrich forwards a translated copy of the contract, and states that the concessionaire had left for the United States for the purpose of purchasing the material necessary for the construction of the telephone lines.

ASTORIA, ORE.—Arrangements are being considered for the establishment of a municipal telephone system in this city, and a committee has been appointed to investigate the matter. Estimates have been secured showing that a plant such as is required would cost about $30,000; that the income with 10,000 subscribers would be $24,000 per year, with operating expenses and interest amounting to about $12,000, leaving a net income of $12,000.

PHILADELPHIA, PA.—The Southern Standard Telephone Construction Company, which has been doing business in Philadelphia with a Delaware charter, is to be dissolved.

PITTSBURG, PA.—The proposed merger of Independent telephone companies under the name of the Interstate Telephone Association has been completed, the location of its headquarters to be at Newcastle. The new association is capitalized at $150,000, and the companies entering into the consolidation are those operating at North Jackson, Ohio; Reaves, Ohio; New Bedford, Plaingrove, Slippery Rock, Harrisville, Mt. Air, Blacktown and New Wilmington, Pa.

DURAND, WIS.—Negotiations have recently been concluded whereby the Durand Light & Power Company has disposed of the telephone equipment and business of the company, located in Durand, and with connecting lines to Arkansas and Eau Galle, to Frank Pierce, as trustee for the syndicate of local stockholders of the Durand Light & Power Company who have withdrawn from that company. It is the purpose of the new proprietors to refit the exchange, and further extend the system.

UNDERGROUND

ARGENTA, ARK.—It is quite probable that in the near future all wires in the business section of the city will be placed underground.

SACRAMENTO, CAL.—Plans are being discussed in this city for compelling the telephone companies to place all wires in the business section of the city underground.

CHAMPAIGN, ILL.—Work is to be commenced at once by the Central Union Telephone Company on its conduit system in this city.

CLINTON, IA.—The Iowa Telephone Company has commenced work on its new underground system in this city.

GREENVILLE, MICH.—An underground system is to be installed at this city by the Citizens' Telephone Company.

JOPLIN, MO.—An extensive conduit system is to be installed at Joplin by the Missouri & Kansas Telephone Company.

CAMDEN, N. J.—Application has been made by the Delaware & Atlantic Telegraph & Telephone Company for permission to place some of its wires underground in this city.

WINSTON-SALEM, N. C.—A new conduit system is to be installed by the Southern Bell Telephone & Telegraph Cimpany.

HAMILTON, OHIO.—Permission has been granted to the Hamilton Home Telephone Company to place its wires in conduits on certain streets in Hamilton.

SPRINGFIELD, OHIO.—The desirability of placing all wires in conduits has been taken up by the City Council.

MEMPHIS, TENN.—The conduit system of the Memphis Telephone Company is to be extended in this city.

MORELIA, MEXICO.—A complete underground telephone system is to be installed in this city by the recently organized Compania de Telefonos Comerciales. The company, which is capitalized at $80,000, expects to build long distance lines to all important places in the state.

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Telephone Engineering and Construction
Plans, Specifications and Estimates Promptly Furnished
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Protection of Crossings with High Tension Power Transmission Lines.
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POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

COMPANIES wanting a manager who will improve their service and save them money should answer this ad; experienced manager and electrician with technical training. Address Lock Box 363, Decatur, Ill. 1141

POSITION wanted, experienced with plant maintenance and reconstruction, circuit design, testing, adjusting and repairing cables and all apparatus; have served as lineman, inspector, switchboard inspector, wire-chief, superintendent. Any location considered. West preferred. Address No. 1146, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th st., New York.

EXCHANGE manager, thoroughly experienced in both a business and technical way desires change. Apparatus and both systems understood. Complete exchanges planned and constructed. Any location. Address No. 1148, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—By a strictly first-class, up-to-date telephone manager and const. man; 12 years' experience from the ground up. Specialty, overhauling run-down plants. Present position, manager 900 telephones. Highest recommendations. Will give you my services 30 days free if I don't deliver the goods. Salary $80. West preferred. Address H., care of Downing Electric Company, Fort Dodge, Iowa. 1149

POSITION WANTED.—As manager in a city of not less than 50,000. At present manager plant of 3300 telephones, 12 years' experience, 6 years present position; technical education. Understand all branches of business. Reason for change, present plant reached highest development. For further particulars address No. 1150, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—Married man 34 years old, 10 years in magneto and construction work wants steady place as manager or trouble-man. References. Address Box 178, Muscatine, Iowa. 1151

HELP WANTED

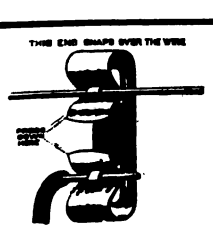
The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—A competent telephone manager to make a small investment in the telephone business. Exceptional opportunity to the right man. Box No. 1147, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED

The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.



Fahnestock
"Snap-Over" Connector
For connecting bridging 'phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.
FAHNESTOCK ELECTRIC CO.
129 Patchen Ave. Brooklyn, N. Y.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN
GERMAN SILVER
RESISTANCE SHEET AND WIRE
COPPER WIRE
BRASS, BRONZE AND COPPER

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THE PARAGON BATTERY BOX

Protects your batteries, prevents broken connections and provides a neat receptacle for unsightly exposed batteries in desk or hotel type magneto telephones.

F. W. PARDEE, Mfr.

52 FIFTH AVE. CHICAGO

WILLIAMS TEST CLAMPS

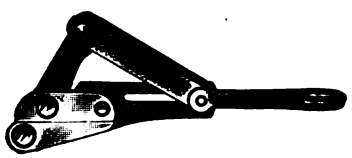
Will pay you a fine profit in the saving of labor and material. They save skinning—they save re-taping—they save time—they save the wire. Send 75 cents for a pair (two), postpaid, on 30 days' trial. Your money back if you want it.

The Williams Test Clamp Co.

720 Electric Bldg. Cleveland, O.

KLEIN'S NEW "CHICAGO GRIP"

is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



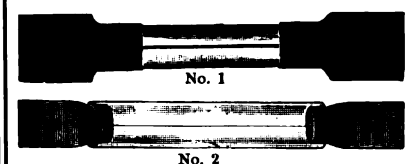
No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.

The CONDITION of the FUSE

SEEN AT A GLANCE THRO. THE GLASS



No. 1

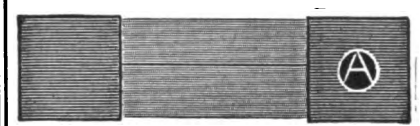
No. 2

THE "VERIBEST" FUSE

(PATENTED)

The Most Perfect Fuse Made. The Wire is protected throughout. A Glass Enclosed Fuse.

PRICE $1.25 PER HUNDRED



Mica Fuses

Copper Term., $1.25 per 100

Fell Term. 1.00 per 100

APPLETON ELECTRIC CO.

CHICAGO NEW YORK

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THE WESTINGHOUSE STORAGE BATTERY

Ask for Catalog 256-J

The Westinghouse Machine Company

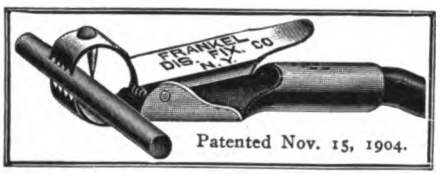
Storage Battery Dept.
East Pittsburg, Pa.

Frankel's Electric Testing Clips

SHORT CUTS FOR TROUBLE HUNTERS

You need not waste time baring the wire.

Constructed to test any size line.



THE TEETH grip the line or binding post.

THE PIN pierces the insulation and makes a perfect test connection.

Sample Dozen	-	12½ Cents Each
100 Lots	- -	11 " "
500 "	- -	10 " "
1000 "	- -	9 " "

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Our Portable Instruments are recognized as THE STANDARD the world over. Our STATION VOLTMETERS and AMMETERS are unsurpassed in point of extreme accuracy and lowest consumption of energy

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New York Office—74 Cortlandt Street.

STANDARD PORTABLE DIRECT READING

VOLTMETERS, AMMETERS, MILLIVOLTMETERS, VOLTAMMETERS, MILAMMETERS, OHMMETERS, PORTABLE GALVANOMETERS, GROUND DETECTORS AND CIRCUIT TESTERS.

Weston Standard Portable Direct Reading Voltmeter. Model 1.

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Find It with a Voltmeter.

The new Pignolet catalog tells you how, and contains other information that is worth money to any live telephone man.

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When speed in installing conduit is desirable, the use of

Orangeburg Fibre Conduit

will ensure the completion of the work in nearly one-half the usual time and at much less expense.

One man in the trench and two helpers above can lay Orangeburg Fibre Conduit at the rate of 15,000 duct feet per day.

Rodding can be quickly accomplished; satisfactory results are obtained by using a No. 6 iron wire instead of the usual rods and rope. By reason of the interior smoothness of the duct, and its freedom from concrete seepage, the wire does not encounter any off-set at the joints.

Lightness, ease of laying and inexpensiveness make Orangeburg Fibre the ideal conduit for underground installation.

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Chicago Office: 1741 Monadnock Building
Pierson, Roeding & Co.: San Francisco, Cal., Los Angeles, Cal., Seattle, Washington.
McClary-Jemison Co., Birmingham, Ala.

THEY ALWAYS PROTECT

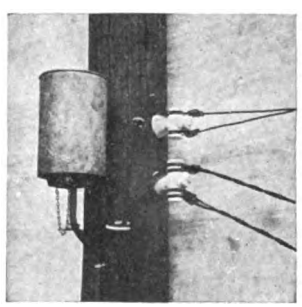
SKY ROCKET ARRESTERS

always offer an easy path of low resistance to the ground. They cost little, save much, never fail, never deteriorate.

You can pay more, but you can't get anything better.

Write to-day for details and prices.

CHANCE MANUFACTURING CO.
CENTRALIA, MO., U. S. A.



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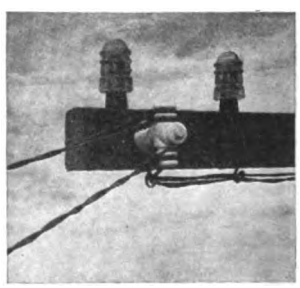

SUGGESTION No. 4

SUGGESTION No. 5

SUGGESTION No. 8

Somo "UNIVERSAL INSULATOR" Suggestions

They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
Grooves for any direction—Universal,
All porcelain—No rot or rust and very neat.
Cheap to erect; cheaper to maintain.
WRITE FOR DESCRIPTIVE LITERATURE

UNIVERSAL SPECIALTY CO., 118 S. Seventh St., Terre Haute, Ind.

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CABLES

TELEPHONE
WIRE

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WIRE STRAND

JOHN A. ROEBLING'S SONS CO.
TRENTON, N. J.

IRONITE

No matter how low the price of copper may be IRONITE is always cheaper, stronger and better. Ask for a free sample.

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SILK AND COTTON MAGNET WIRE

Fine Sizes a Specialty

The man making small repairs or experimenting and the manufacturer using tons can both secure the quickest possible shipments.

It will pay you to give us your orders.

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STROMBERG-CARLSON

Standard Capacities

Sizes: 1 to 450 Pairs

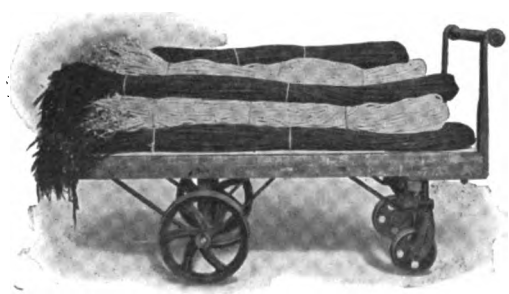
S. W. P. Insulation

D. W. P. Insulation

TELEPHONE MFG. CO.

CHICAGO, ILL. ROCHESTER, N. Y.

STROMBERG-CARLSON
QUALITY
SWITCHBOARD CORDS
WEAR WELL—
BETTER THAN OTHERS



100 DIFFERENT TYPES
WE HAVE WHAT YOU WANT
SEND US A SAMPLE ORDER TO-DAY

STROMBERG-CARLSON TELEPHONE MFG. CO.
ROCHESTER, N. Y. CHICAGO, ILL.

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National Pole Company

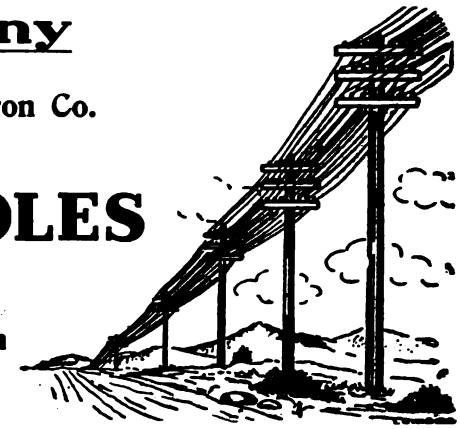
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from Maine to Washington



The Valentine-Clark Co.

ERNEST L. CLARK, President

Michigan / Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.

Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE

234 La Salle Street — Chicago, Ills.

Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.

Tribune Building, Chicago

DOTY LUMBER AND SHINGLE CO.

Manufacturers of

Washington Fir

Cross Arms. Red Cedar Poles and Piling.

In any length.

PROMPT SHIPMENTS

Doty, Washington

YOU WILL FIND IN **BISSELL** Idaho and Michigan **CEDAR POLES**

that combination of high quality and low price for which you've been looking.

Write for Leaflet Number Three.

THE F. BISSELL COMPANY, Toledo, O.

WHITE CEDAR POLES

Prompt Shipment — Best Grade

Standard Cedar & Lumber Co.

34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

POLES Red Cedar and White Cedar

Western Sales Agent — "C. A WOOD PRESERVER"

WILL F. BRUER, 18 Walnut St., Kansas City, Mo.

WHITE CEDAR POLES

LARGE STOCK 14 TO 65 FT.

—PROMPT SHIPMENT—

YARDS: MENOMINEE, MICH. / ESCANABA, " / SUPERIOR, WIS. / DEER RIVER, MINN.

FRANCIS BEIDLER & CO.

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POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY

FARIS & MAYHEW LUMBER & POLE CO.

202 & 203 Continental Building, Denver, Colo.

IDAHO AND MICHIGAN

CEDAR POLES

Large Stocks (10 Yards) Low Prices

Idaho Red Cedar Poles Our Specialty

Western Lumber & Pole Co.

SUITE 415 CHARLES BUILDING · · DENVER, COLO.

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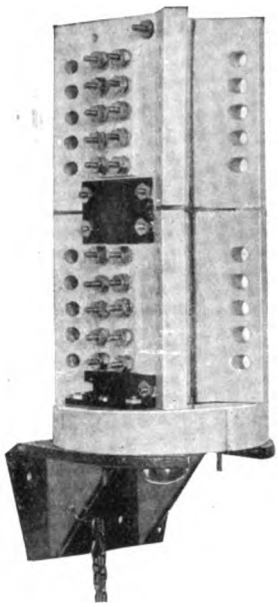
AN ALL PORCELAIN CABLE TERMINAL

(Type DP)



Price Very Low

Send for Sample

AMERICAN ELECTRIC FUSE CO.

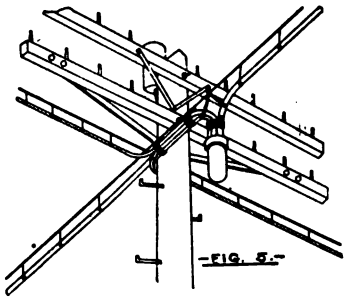
Muskegon, Mich.

Eastern Sales Office, Morton Bldg., New York, N. Y.

Matthews' Cable Splicing Joints

(Formerly called Hargis Joints)

Patented Oct. 17, 1905



Patent Number 802,337

Fig. 5 shows a No. 2 Matthews' Joint which joins together a 200 pair main cable, a 100 pair extension, a 75 pair branch and a 25 pair tap. The drawing was made from a photograph furnished us by R. Cline, Supt. of Construction of The Central Union Telephone Co., Indianapolis.

Any good trouble man will tell you that the first place to look for a water soaked cable is at your horizontal splices. He will tell you that this condition is nearly always caused by a defective wiping of the two ends of the horizontal splice. He will show you that a cable could not possibly get water soaked where Matthews' Joints are defectively installed. See our ad. in Aug. 8 issue.

Send for 32 page Booklet on Cable Splicing. Its free.

W. N. MATTHEWS & BROTHER

Manufacturers of Patented Money-Saving Specialties

214 NORTH SECOND STREET ST. LOUIS

WHITE CEDAR POLES

Buy from the Producers and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

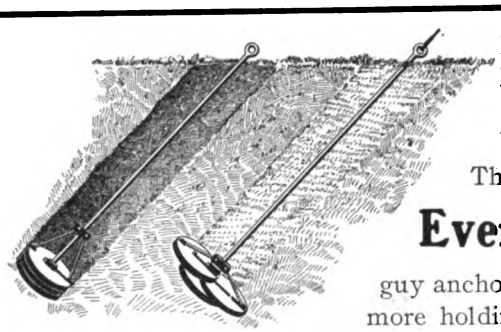
LARGE LOTS of LONG POLES

Well Seasoned White Cedar

Immediate Shipment

J.W. Morrison Lumber Co.

General Office: 919 Lumber Exchange, Minneapolis



Price DOWN— Efficiency UP. That's the

Everstick

guy anchor. It has more holding surface than any other, and is sold at a lower price.

WRITE FOR PRICE-LIST

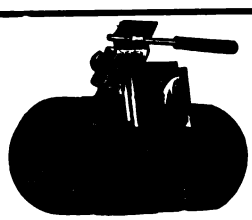
SPECIALTY SALES COMPANY

Cedar Rapids, Iowa

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 26 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Boyne Falls. W. C. Sterling & Son Co., Monroe, Mich.



M. & B. Ground Clamp

Patent applied for.

For connecting telephone ground wires to lead or iron pipes. Simple in construction; easy to adjust; fits any size pipe. Remains tight whether pipe expands or contracts. No loose connections when our clamp is used. Write us for samples and prices. Milwaukee Electrical Specialties Co., Box 393 Milwaukee, Wis.

POLES AND PILING Chestnut, Red Cedar and Cypress Lengths 16 to 65 feet

J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.

PORTER CEDAR CO., Saginaw, Michigan

POLES

Northern White Cedar

Give best service. Our prices are lowest. May we quote?

ITASCA CEDAR COMPANY, Deer River, Minn.

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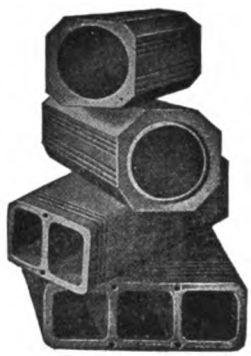
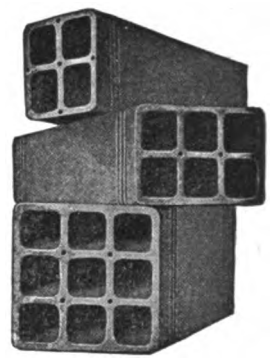


VITRIFIED

CLAY CONDUIT

SINGLE and MULTIPLE DUCT



IMMEDIATE DELIVERY ON ALL STANDARD SIZES

Factories: New Jersey, Pennsylvania, Ohio

Standard Vitrified Conduit Company

Main Offices: 39-41 CORTLANDT ST., NEW YORK, N. Y.

THE Clement Automanual System is neither an accident nor a sudden inspiration, but the fruit of several years of deliberate, logical, systematic study and work on the part of the inventor, assisted by an organization of experts.

The development of the apparatus has received the same careful study and patient, deliberate attention to detail.

Every contingency met in actual practice is provided for and the system is so complete—so flexible—that any step or function that can be performed in either a full Automatic or a full Manual system is performed by the Automanual more easily, more economically, more efficiently and with a lower percentage of error.

Trade Mark
CLEMENT AUTOMANUAL
Reg. U. S. Patent Office

The North Electric Company

DALLAS **CLEVELAND** **KANSAS CITY**

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OUR SPECIFICATIONS

COMMERCIAL

A—Compound pours freely at 300 deg. Fahrenheit.
B—Compound exerts no corrosive action on bright copper at a temperature from 300 deg. F. to 350 deg. F.
C—Flashing point of compound 418 deg. F.
D—Burning " " 510 " F.
E—Compound shows no cold flow.
F—Compound loses practically nothing (.005%) after 24 hours at a temperature from 224 deg. F. to 245 deg. F.

Note high melting point, making it especially desirable for Southern climates.

Ask for prices on "Commercial Cable Compound." Made to above specifications—weighs 8 lbs. per gallon.

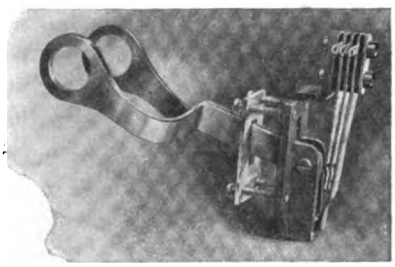
COMMERCIAL

Commercial Electrical Supply Co.

ST. LOUIS, MO.

"THE" Supply House for Cable Construction Materials.

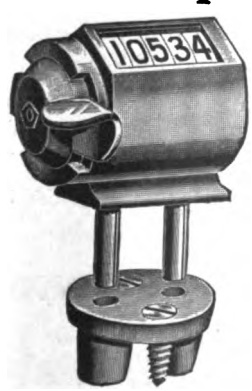
"LONG DISTANCE" No. 58 HOOK SWITCH



The smallest efficient hook made. Can be used in any cabinet. All springs best German Silver. All insulation pure hard rubber. Base and Hook made of Stamped Steel. Especially useful where space is limited and a thoroughly high grade, efficient hook is required.

LONG DISTANCE TELEPHONE MANUFACTURING CO.
SOUTH BEND, INDIANA

"The Operating Cost" of Handling Each Call



including the entire expense of operating the unit may be readily determined by peg counts made by means of the

Veeder Counter

It is indispensable in a well managed telephone exchange.

Booklet tells why.

VEEDER MFG. CO.
11 Sargeant St., Hartford, Conn.

Manufacturers of
Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings

SECURITY CABLE COMPOUND

IS BEST — AND WHY

Security Compound remains plastic whether it be hot or cold. It has no injurious effect on wire or insulation as it contains no alkali or acid. It is absolutely waterproof.

The price is low. Write today and let us quote you.

THE F. BISSELL COMPANY
TOLEDO, O.

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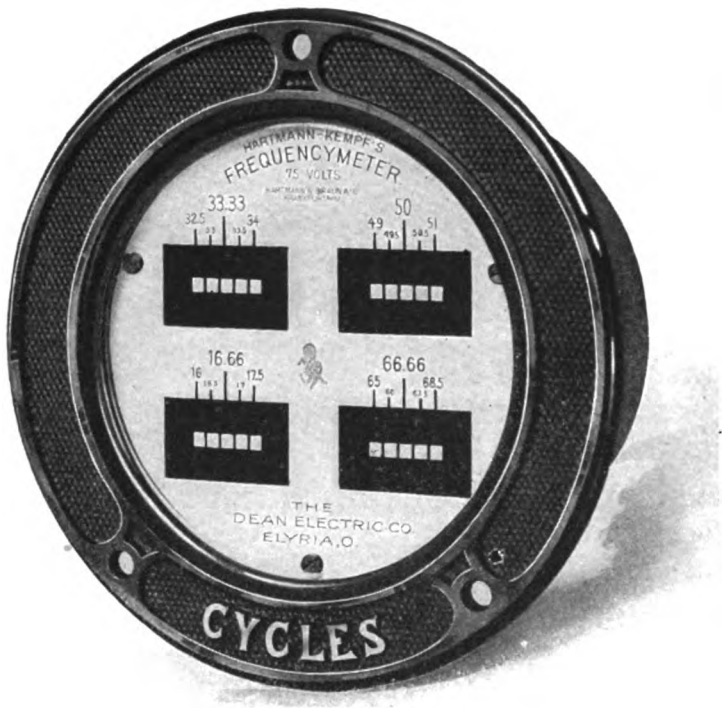


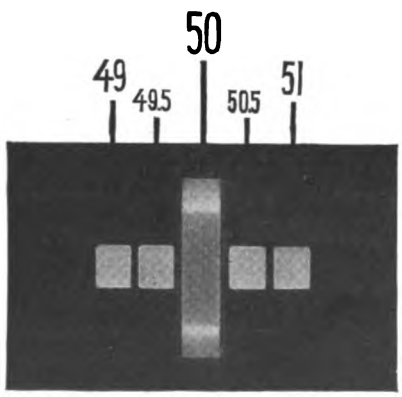
SCIENTIFIC SELECTION

¶ **The "Dean" Harmonic System** is still the only successful party line selective ringing apparatus in the world.

¶ **Absolutely no Failures** is the "Dean" record since the introduction of our Harmonic Converter (registered trade-mark) and our Harmonic telephones.

¶ **No Working Installations** can be shown by some of the makers of imitating appliances—hence the long list of "Dean" successes is abundant proof of superiority.

¶ **Even the Slightest** uncertainty is now eliminated —"Dean" selective ringing is an exact science through the use of the



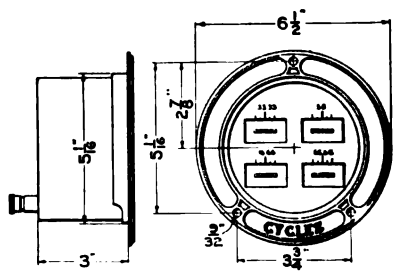
Hartmann-Kempf Frequency Meter.

¶ **With this Instrument** the number of cycles per second may be readily determined—the reading is instantaneous.

¶ **Plain Readings** are indicated by the reeds which vibrate as illustrated. Each of these reeds is a separate unit, even if one should be broken, the efficiency of the others would not be impaired.

¶ **Their Permanency** has been proven by three years' continuous vibration before the invention was marketed.

¶ **Hartmann-Braun A. G.,** the manufacturers, of Frankfort a/M, Germany, have made us the American sales agents for this special instrument.



¶ **The Exact Dimensions** are shown in this drawing. The meter may be mounted in a portable case, or on a suitable mounting board above your power panel; or, it may be specified for any new "Dean" board.

¶ Send for Dean Folder No. 15.

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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Generator Call Wall Telephone

CENTRAL ENERGY STYLE

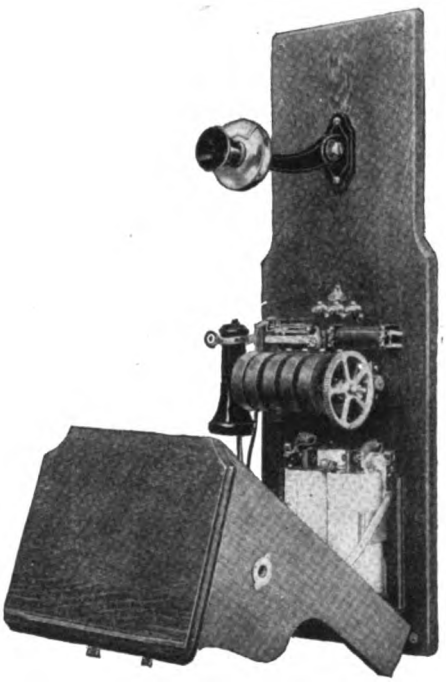
¶ **Accessibility** is best manifested in our **Central Energy Style Telephone** because all the apparatus is conveniently assembled on the backboard—except the ringer.

¶ The construction of the telephone box and backboard provides the real feature of **accessibility** in this type of telephone—the equipment being the same as furnished with our several forms of Magneto Telephones.

¶ Unfasten the screw-lock from front of telephone and **the entire box** hinges from the bottom, exposing the complete contents, as effectively shown in our illustration. To be able to approach the entire equipment without interference by the woodwork construction—**is real accessibility.**

STROMBERG-CARLSON CABINETS

¶ You will be safe in buying "Stromberg-Carlson" telephone woodwork merely on its appearance, but we don't ask you to do this—**we guarantee to deliver to you cabinets that we know will outwear and outlast all others.** ¶ **Firstly**—we know the quality of material cannot be improved. ¶ **Secondly**—that our cabinets are perfectly adapted to the purpose for which they are used. ¶ We offer you the best obtainable—it is economical to buy the best always.



No. 716 Telephone

STROMBERG-CARLSON APPARATUS

¶ First of all you should become thoroughly acquainted with "Stromberg-Carlson" Magneto Apparatus. ¶ Our No. 7 TRANSMITTER is earning a higher position daily—are you interested enough to write? ¶ The creditable fact is that it excels under all tests where others fail. ¶ Is perfect transmission worth anything to you? ¶ Equally efficient are all other parts of Stromberg-Carlson Magneto Apparatus.

OTHER FEATURES

¶ In mounting all the apparatus on the backboard—the line binding posts have been taken within the space covered by the telephone box—simplifying as well as greatly improving the general appearance. A partition in the box comes between the generator and top of the batteries, forming a separate yet ventilated compartment for the batteries.

¶ There is plenty of room for installing the "Sure Ring" Condenser and "Push Button Key" which are furnished with any standard Series or Bridging equipment in this style of telephone woodwork.

¶ Further information and prices contained in our Phamphlet No. 1, mailed upon request.

STROMBERG-CARLSON TEL. MFG. CO.

ROCHESTER, N.Y.-CHICAGO, ILL.

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"Waiting Action of Bell Company"

That notation opposite several companies' names on our prospect list, spells inaction. It also calls to mind the Fable of the Tortoise and the Hare. Do you remember that the hare thought himself such a Live Proposition that after running part of the race, he could safely lie down and snooze till the Tortoise caught up to him and then beat the Slow Guy by a couple of hops? But he overslept and the Tortoise plodded by and won.

The Independent Company

that has made a part of the race and then deceives itself into the belief that it can lie dormant "waiting action of the Bell Company" is liable to wake up and find the race lost.

Just remember

that you can't afford to stop running in the race for business. Keep your plant at the top notch of efficiency all the time and don't wait to make improvements till your competitors force you to. Force them, don't let them force you.

Buy Automatic now

and keep ahead of your competitor. Don't wait to see what your competitor is going to do. Improve now and with Automatic.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
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Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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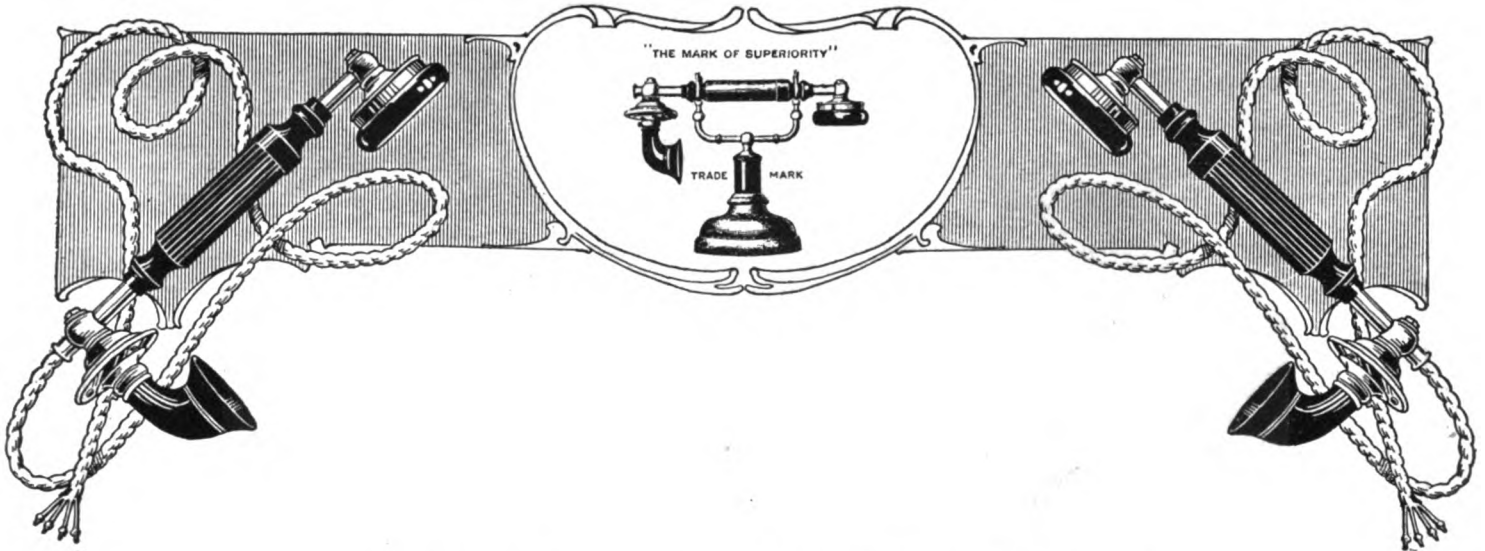

WANT TO SAVE SOME MONEY?

We are going to launch a proposition in the next issue of this magazine that will interest you.

In order to give you an inkling we'll just say:

Don't buy receivers till you see our next advertisement!

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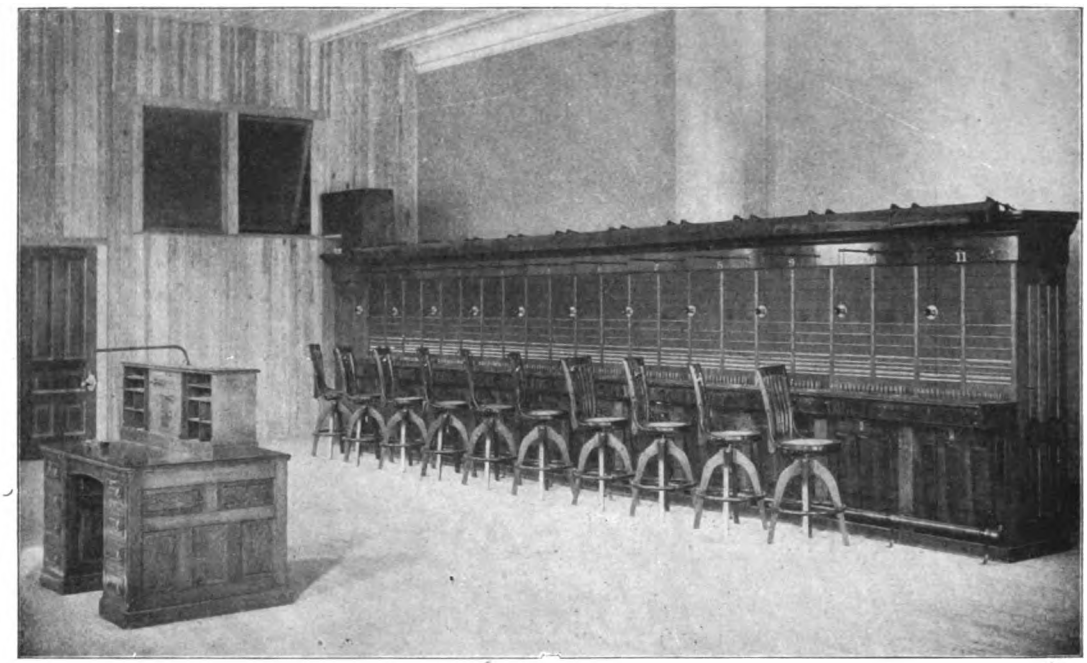
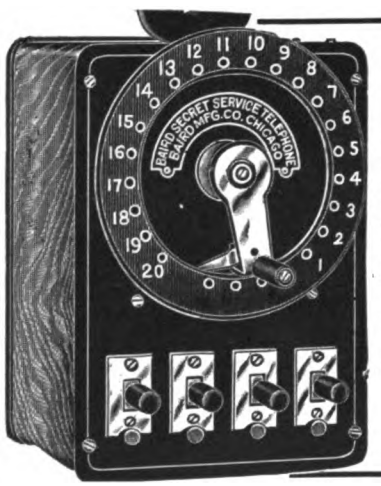


11-POSITION COMMON BATTERY MULTIPLE BOARD

WE ARE IN POSITION TO MAKE ANY SIZE EQUIPMENT OR ANY TYPE OF BOARD YOU REQUIRE—WRITE US.

STERLING ELECTRIC COMPANY

GOOD GOODS LA FAYETTE, IND.



Operator's Calling Device

BAIRD PARTY-LINE
SECRET-SERVICE
TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

Write for Catalogue and Testimonials.

BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.

U. S. COMBINED

CASH REGISTER and PAY STATION

GIVE THE BEST SERVICE

Single Gong only A Cash Ticket with every collection

NO ERRORS CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.

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"ROBERTS" AND WHAT IT MEANS

9 The system's advantages include Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, etc., and adaptability to any existing local battery exchange.

Trouble Is Located by the Operator

In its susceptibility to trouble and the frequency with which it occurs the Roberts System compares most favorably with any other party-line system, as we have demonstrated by two years of practical experience in the operating field, and when it does occur it is not nearly as serious or as expensive for us as it is for the others, because about every conceivable variety of it may be located in a moment by the operator, and not only located, but defined as well, simply by operating the line in the regular way up to the seat of the trouble. "Short circuits," "open circuits," and "grounds," whether on the line or in the instruments, are located and defined with equal facility. The fact that the line between central and the "trouble" is intact with traffic is, in itself, a decided advantage, while the saving in time, temper and expense effected by the operator's ability to tell the trouble man what's the matter and to direct him to where his services are required, will readily be appreciated.

Think it over and write for bulletins.

HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago

MONARCH FEATURES

Certain features have been so persistently brought out in Monarch equipment that they are looked for in each new piece of apparatus we produce and have come to be recognized as Monarch characteristics.

One is the remarkable ease with which our apparatus can be taken apart and reassembled and the accessible way in which the various parts are arranged.

Another is the simplicity of design, which insures reliability of operation and reduces the chances of trouble.

Still another is the perfect mechanical construction which enables us to produce instruments of the highest efficiency

We are constantly studying the requirements of operating companies and where we see the need for improvement at once set about supplying it. Our apparatus contains many features which will interest you.

Let us send you a catalogue.

MONARCH TELEPHONE MANUFACTURING CO.

Factory and General Office:
Washington and Morgan Streets, CHICAGO, ILL.

Branch House:
177 Main Street, DALLAS, TEX.

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Central Energy Telephones for Long Distance Exchange Service

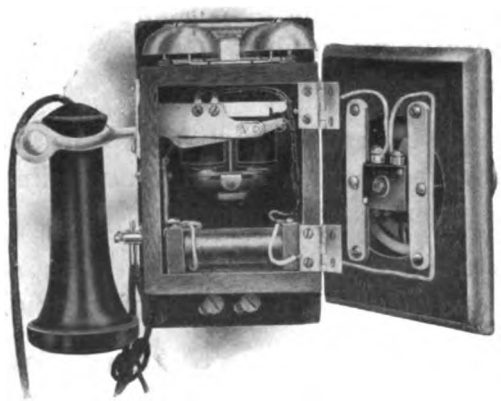
For Hotels, Schools and Residences

Closed View.

Most Compact and Most Accessible Phone Ever Built

Absolutely the smallest, yet most perfectly constructed 'phone of its type on the market.

Send us your specifications covering your requirements on complete Central Energy



Door Open, Showing Interior View

Lamp Line Equipments for Hotels, Schools, Etc.

Showing Door and Body of Phone Open, giving access to all parts.

The Wesco Supply Company.

Manufacturers

High-Class Telephone Apparatus

Main Office and Factory: St. Louis, Mo. Branches: Fort Worth, Tex., and Birmingham, Ala.

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

VOL. XVIII. NEW YORK, SATURDAY, AUGUST 8, 1908. No. 6.

PUBLISHED WEEKLY BY THE

McGraw Publishing Company

JAMES H. McGRAW, President.
J. M. WAKEMAN, 1st Vice-President. A. E. CLIFFORD, 2d Vice-President.
CURTIS E. WHITTLESEY, Secretary and Treasurer.

239 WEST THIRTY-NINTH STREET, NEW YORK.

TELEPHONE CALL: 4700 BRYANT.

CHICAGO OFFICE.....590 Old Colony Building
CLEVELAND OFFICE.....1015 Schofield Building
PHILADELPHIA OFFICE.....Real Estate Trust Building
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The Delphos Decision

Judge Quail, of Lima, Ohio, seems to be a man who knows how to deal with a joke sprung in open court. Some men cast aside points of law, and look upon the merits of the case he has just decided from an outsider's viewpoint, free from technicalities. To such as these, the support of the contention that, unless the Delphos Home Telephone Company should break its contract with its old associate, and furnish long distance business to the Bell company, it would tend to promote a monopoly, would furnish a proper topic for the vaudeville stage. As it is, Judge Quail, by frowning upon the contention, has perhaps destroyed the budding hopes of Delphos telephone magnates that they might make their town famous in the industry. Had their words prevailed, Delphos would have been the one place in the country where an associate in the great Bell system had forced the cancellation of a legal agreement on the ground that it was against public policy, because it tended to promote a monopoly in telephone service. In other words, a semi-official partner of the Bell company has tried to win a case in court by contending that a monopoly of telephone service is wrong and illegal.

It is no wonder that the introduction of this argument from so unexpected a source caused Judge Quail to beg the whole question, and skilfully sidestep the issue, by stating that maintaining the contract in force would not create a monopoly, thus showing the contention to be ill-founded, but not passing upon its merits.

Of more serious interest, and importance, perhaps, is his discussion of the element of mutuality in the contract. There is no uncertainty about the words in which he disposes of the plea of the attorneys of the local company that all the advantages were in favor of the Independent long distance company. In early days, when the local company was denied an opportunity to secure connections with long distance lines on reasonable terms by the only company operating them—the very one to which it had recently planned to give business in violation of its contract with the Independent long distance company—it was obliged to guarantee something substantial before men could be induced to risk the money required to build toll lines into Delphos. The 99-year contract was the guarantee of the permanent worth and safety of their investment, and it may be assumed that the Delphos company was then glad to enter into it, having a full knowledge of what would happen if it were left to sink or swim in its isolation. Judge Quail's ruling that the obligations incurred in past times of stress cannot be set aside lightly when conditions change is in line with the ideas of fair-minded men, who realize that a reasonable assurance of permanence in business relations demanding heavy investments is necessary for healthy growth. This section of his opinion is of broad interest in the Independent field. It gives a firmer legal footing to the arguments of strong organization men who have in the past urged the necessity of mutual co-operation almost solely on sentimental grounds.

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Telephone in the Home

Note is made in one of the newspapers this week that a woman who had a telephone in her apartment gave notice of discontinuance. When the representative of the company inquired if there was any dissatisfaction with the service or anything, she replied that she was dissatisfied with single blessedness and was going to get married. We venture to think that when she has assumed the marital relationship, the telephone will be restored. It would be interesting to know what effect, if any, such social changes have on telephone patronage; in other words, whether many people give up the telephone once they have become accustomed to it. There is, of course, a certain mortality in business life, which will affect the general conditions like any other average; and there will be changes due to hard times, the growth of a community, the establishment of a railroad or steamship line, and other features or phenomena of industrial development. But as the recent year of severe depression has shown, people are slow to lose the telephone habit after once acquiring it, and the "vital statistics" of the telephone industry are very encouraging to those who have put their time and money into it.

Accidents and the Telephone

Limiting risks is the modern idea which is at the foundation of many of the most significant improvements which are being applied in our best managed commercial enterprises. Perhaps the best applications of this principle have been worked out as a result of the persistent educational efforts exerted by the great fire insurance societies. They have made people realize that insurance does not prevent loss—it only distributes the burden so that it will not crush individuals whose property is destroyed. But this distribution imposes annual taxes upon every owner of insured property in the nation.

So, in the work of fire prevention, careful precautionary measures have been worked out, and in these plans it is easy to make a rough division into primary and secondary classes. The first deals with methods of preventing the starting of fires, while the second concerns itself more with devices for extinguishing them promptly when they do start. These same principles are gradually being applied to the prevention of loss from other accidents. These include not only such occurrences as are liable to destroy property in any manner, but also, as has recently been particularly noticeable, very beneficial movements to decrease risk of injury to persons.

Among the instruments in the second classification referred to, in all these projects the telephone has come to occupy a place of the highest prominence. When an accident occurs the first essential thing is to summon human aid. There is no method of communication for this purpose which can be used with greater promptness than the telephone. It has the indispensable advantage over all methods that it can bring to the scene of disaster prepared aid—men who know in advance what they will be called upon to do, and so will come equipped for instant and decisive action.

Nowadays it is almost impossible to look into the use of the telephone in any district without finding places where it fulfills this purpose. Characteristic cases in point are referred to, for example, in the present and each of the two preceding numbers of this journal. The police signaling system shows this function highly developed. The protecting quality of the telephone on the farm referred to in last week's issue is almost too well known to warrant further reference. In the article on the telephone system of the Singer Building elevators is another example, while this week a description of the telephone system in the New York rapid transit tunnels furnishes a fourth. A glance over our plans for future articles reveals many more.

It is worthy of note that in most such systems a telephone installation may be perfectly adapted to emergency service, and yet be so fitted into the daily scheme of affairs that its everyday use more than pays for its maintenance. Thus its cost is a producing investment, and not a tax. The contract agent who works this vein brings in the best kind of business to his company.

The Great Nerve Centers

While the telephone brings its annoyances in some shape to every subscriber, it is the fact that these are so far overbalanced by its advantages that anyone who is used to telephone service misses it seriously if by any chance deprived of it. The telephone has become one of the absolute, fundamental necessities of modern life in every department, and is now as much a factor in domestic economy and convenience as it is in the swift transaction of financial and industrial affairs. These remarks seem mere truisms and platitudes, but they derive new value from such facts as are given in an article appearing in this issue descriptive of the telephone directory of New York City and the methods of handling it.

There lies before us at this moment a small card which was the first telephone directory of Manhattan Island, issued in 1879, and containing 252 subscribers. There also lies before us the latest directory in two stout volumes, each set weighing something over 3½ lb., one volume devoted to Greater New York and the other to the suburban territory around that district, constituting its "sphere of influence." There are now in the region noted about 450,000 telephones, and a directory for each instrument would require 1,575,000 lb. of paper. As a matter of fact, the distributing force that handled this "summer reading" last month had to deal with about 2000 tons of paper. In Manhattan and the Bronx boroughs alone a force of 400 men was required for the job, with trucks and wagons galore.

The article is of great interest in various ways, but does not include all the important or suggestive points that are incidental to the subject. Some of these are brought out in an article on the telephone as "the nerve center of modern business," appearing in *Harper's Weekly* for Aug. 1. In that article Mr. John J. Carty, the well-known telephone engineer, whose vital imprint is stamped so deeply on the whole art, is quoted as making the argument that in a sense the telephone is the creator of modern architecture as embodied in the office building and the skyscraper. "Take the Singer Building, the Flatiron, the Broad Exchange, the Trinity, or any other of the giant office buildings. How many messages do you suppose go in and out of those buildings every day? Suppose there was no telephone and every message had to be carried by a personal messenger. How much room do you think the necessary elevators would leave for offices? Such structures would be an economic impossibility. The same with manufacturing buildings." The district messenger service would, indeed, have become a gigantic institution with its armies of noisy boys; and the telephonic solution, with its little desk set and its directory, seems far preferable to the messenger or the letter carrier, for speed and every other real consideration.

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Telephonic Communication in the Hudson Tunnels

By Robert Savage.

Effective use is made of the telephone in the new Hudson Tunnels, through which are operated passenger trains which will ultimately furnish a connecting link between several of the great steam railway terminals on the New Jersey shore of the Hudson River and New York City, and already carry a heavy traffic. At the present time there are in service two tubes, which extend in tunnels under the Hudson from Hoboken to the lower part of Manhattan Island, continuing under the streets of New York City to the present temporary terminal at Twenty-third Street and Sixth Avenue. Through these tunnels thousands of people are carried daily to and from New York by the Hudson & Manhattan Railroad Company. In the rush hours, trains of three or four cars are run at four-minute intervals, and each car, seating 44 persons, may have its aisles filled with standing passengers, bringing the total number up to 100 or more. This traffic is due to the large number of persons who, working in New York, reside in the near-by towns of New Jersey.

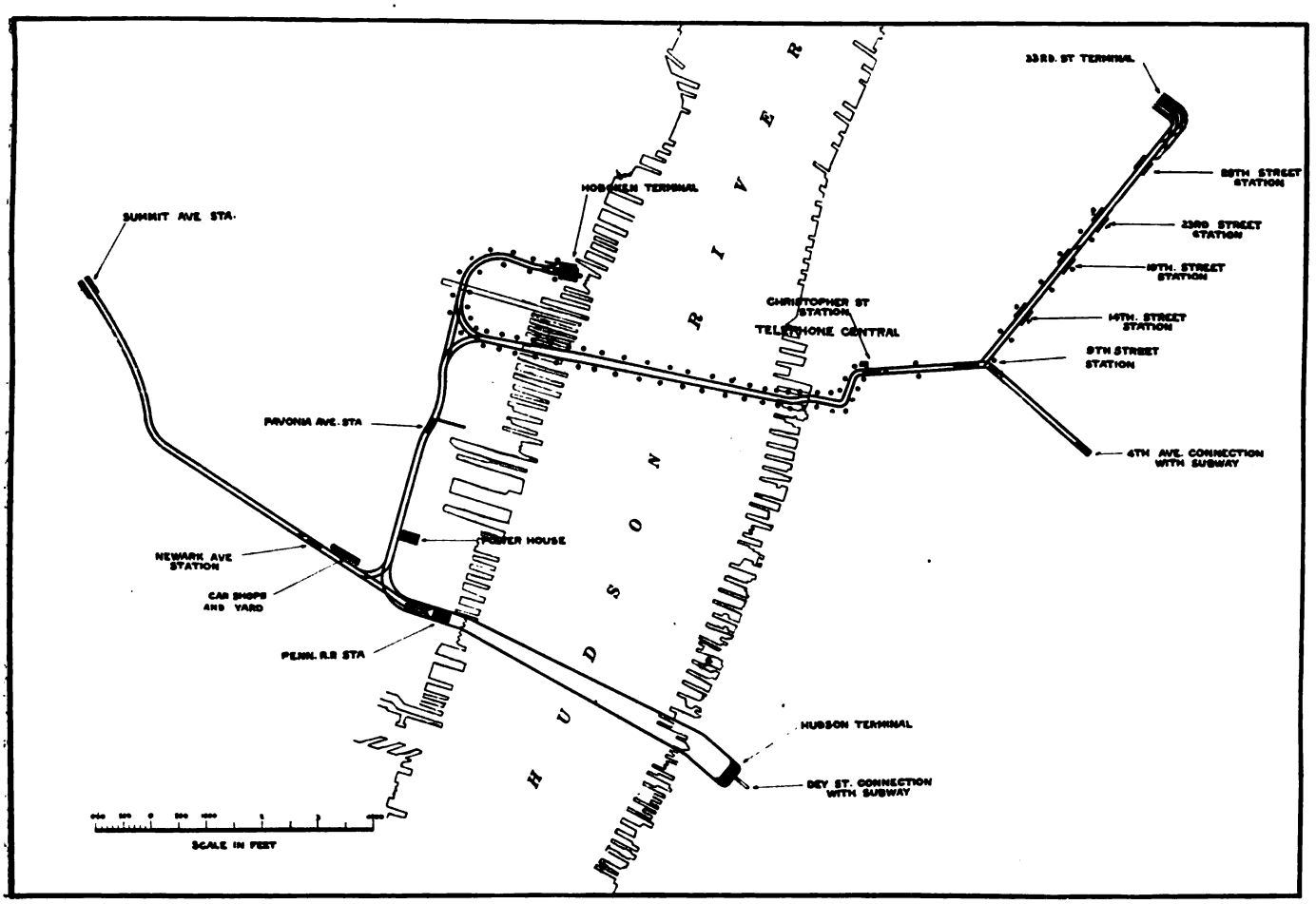

Diagram Showing Location of Tunnels Under the Hudson River Connecting New York with Jersey City and Hoboken. Telephones are Indicated by Dots. Tunnel Sections for Which no Telephone Equipment is Shown are Under Construction.

A comprehensive private telephone system has been installed, the main office being located in the general operating office building in Christopher Street. The switchboard, which is of the common battery type, is located on the third floor. As shown in the accompanying illustration, it is a three-position board, specially designed, on account of the small floor space available, to include within its cabinet all line equipment, including protective terminal and cross-connecting racks, as well as line and cut-off relays. As only 130 lines are installed at present, but two operators' positions are equipped, each having 15 pairs of cords, with the necessary ringing and listening keys and associated signaling apparatus. It is expected that, when the remaining trackage for which plans have been made is completed, the board will be filled to its ultimate capacity of 300 lines. There is space for a multiple of 500 lines, so that the present equipment can be used even if still further telephone facilities are required.

The end panel on the left is used as a testing position, and all the multiple jacks appear here. The corresponding keyboard is equipped with cords and keys for making tests for grounds, crosses, opens, etc. Jacks at this position are of the cut-off type, so that the line may be cleared of battery and other switchboard connections, making it possible to test directly from the jack. The main frame or cross-connecting rack, which is enclosed in an extension of the switchboard frame, contains terminal protective apparatus of a standard lightning arrester and heat coil combination type. This equipment is the "type H" switchboard protector and standard distributing frame manufactured by the American Electric Fuse Company. Line and cut-off relays are placed in the back of the switchboard, below the cord shelves, in order to economize space. From the distributing rack cables run to the line springs of the test multiple jacks. From the contact springs of these jacks short cables extend to the relays, and here make connection with cables carried back to the regular multiples.

As shown in the circuit diagram, no relay is directly associated with any cord circuit, the supervisory lamp being controlled by a 120 ohm resistance, which is cut in or out of the

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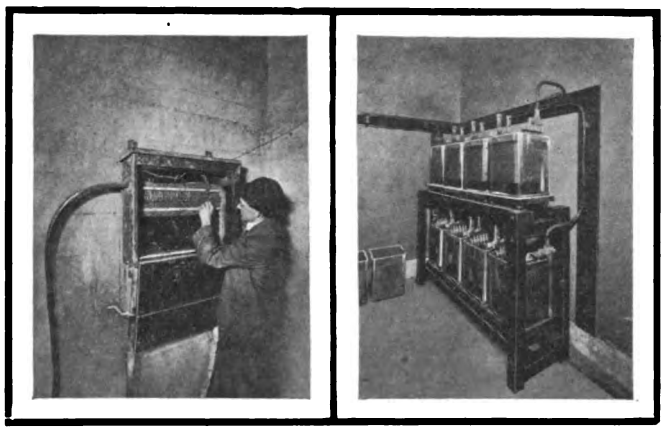
circuit by the line relay which becomes associated with the cord when the plug is inserted in a jack. The resistance is placed in parallel with the cut-off relay coil by the action of either subscriber on hanging up his receiver, thus increasing the amount of current passing through the supervisory lamp and



One of the Junction Boxes Located in the Tunnels and One of the Tiers of Cells of the Storage Battery.

causing its illumination. As all lines are of moderate length this plan works very well.

The power equipment and batteries are placed on the fourth floor. For charging purposes a 5½-hp, 625-volt, 1050 r.p.m., 7.7 amp motor, direct connected to a 3-kw, 30-volt, 100-amp, 1050 r.p.m. generator is used.

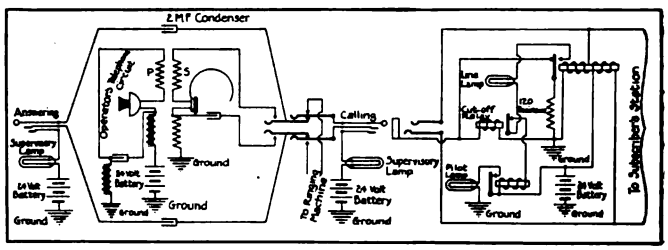
The two ringing dynamotors are run on the 24-volt battery at a speed of 1000 r.p.m. and deliver current at 80 volts. Each machine is used alternately every 24 hours. A hand generator, for emergency use, is located at each operator's position.

The power board, consisting of one large slate panel, is furnished with necessary switches, voltmeter, ammeter, circuit-breaker and fuses, properly connected.

In the wire distribution system, cables are run from the office on Christopher Street through the tunnels uptown in New York, and also to Hoboken. A 50 pair cable is run to Ninth Street and Sixth Avenue in New York, where it is reduced to 30 pairs which extends to Thirty-third Street, which is to be the uptown terminal of the tunnel. Two 120 pair cables are run under the Hudson River, one in each tunnel to a point known as Caisson No. 1 in Hoboken. The cables are then reduced to 20 pair cables and run to the Hoboken terminal at the Lackawanna station. The remaining 200 pairs of wires will be run from Caisson No. 1 through the tunnels now under construction.

each side. The number of ducts for all purposes varies according to requirements in different parts of the tunnel. These ducts carry power cables through which electricity is transmitted from the power station for running cars and lighting the tunnels and stations. Some of the power cables carry three-phase alternating current at 11,000 volts, 25 cycles.

Although no special pains have been taken to separate to the greatest possible extent the telephone cables from these power cables up to the present time, no noise or other disturbance has been brought into the system as a result of running the telephone cables in the same group of ducts with those carrying the high-voltage alternating current. The possibilities in this line, of course, have not been fully tested as the amount of current,

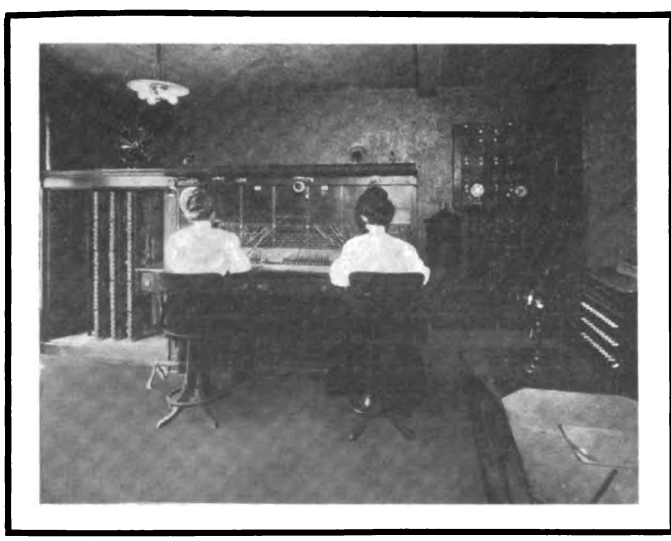


Diagrom of the Switchboard Circuit.

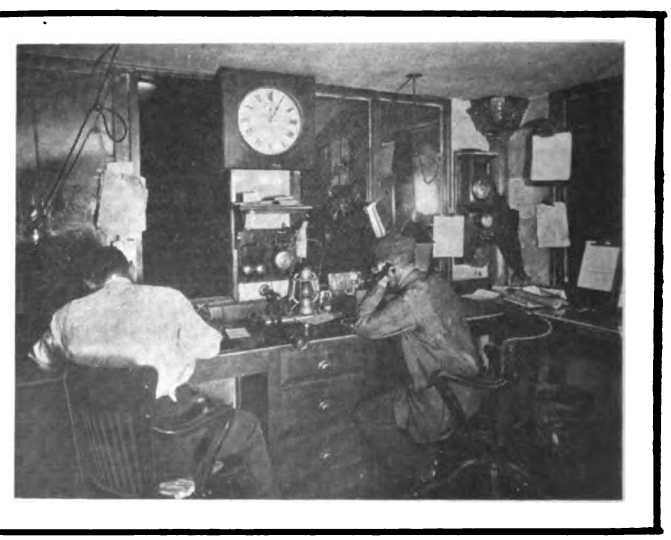
and, therefore, the possible inductive effect, will be greatly increased when the power cables become loaded to their full capacity with the greater use of the tunnels.

The proximity of telephone circuits to high-voltage circuits furnishes a sufficient cause for the installation of lightning arresters on the switchboard, although the cables are not carried out of doors at all, and only one or two loops to substations can by any possibility be exposed to the action of lightning.

Splicing chambers are located about 300 ft. apart throughout the tunnel. In order to give a practical scheme of distribution from cable to telephones located within the tube, junction boxes to which wires in the cables are brought out are located at intervals of approximately one-half mile. Wires from the cables are brought into these junction boxes through potheads, and those to be continued to substations from each box are run to their terminal points through a five-pair cable of rubber-insulated wires, suspended from a messenger wire carried along the wall of the tunnel. This five-pair cable usually carries three pairs of telephone wires and two pairs of wires connected to the emergency signal system, conductors of which are furnished through the same cable used for the telephone system. At the telephone exchange, these conductors are separated between the pothead and the main distributing frame and carried to proper terminals for emergency signaling.



The Operating Room Showing Switchboard and Main Frame.



The Train Dispatcher's Office at the Hoboken Terminal.

All telephone equipment and power apparatus except as mentioned was furnished by the Holtzer-Cabot Company.

To provide space for these cables and others, vitrified clay ducts have been laid in bench-walls at the base of the tunnel on

The tunnel telephones are located about 400 ft. apart. Each telephone is beside an emergency signal box, which is used in case of accidents. A trackwalker, or trainman, in case of necessity, pulls the signal which operates somewhat on the principle

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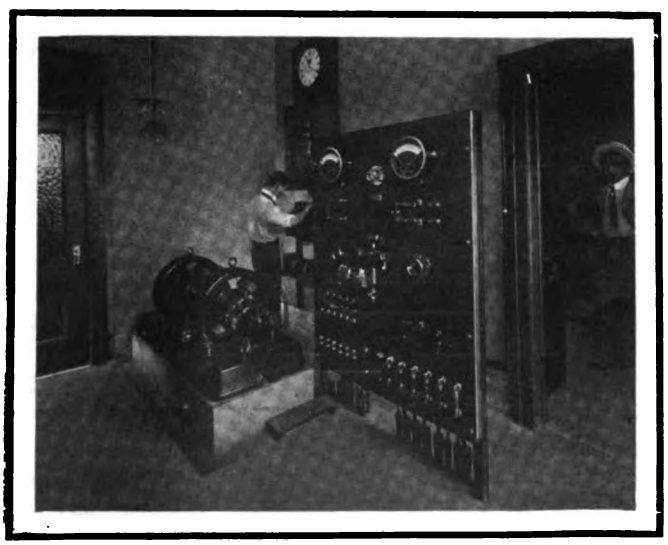
of a fire alarm box, controlling circuits which throw the circuit-breaker at the power house, thus shutting off the current from the line. The telephone in each instance is located beyond the emergency signal box, looking in the direction in which the train moves. The reason for this is found in the necessity for avoiding the possibility of obscuring the signal, as might happen if a man should stand in front of it while telephoning, and also in the purpose to make it easy for a man walking along the track in front of a train which has been brought to a standstill to locate the telephone by the signal, which is illuminated. Telephones are set low on the walls, and the user customarily sits on a stool provided upon the bench-wall while talking. The curvature and width of the tunnels are such that setting the telephone at a greater height would bring the user a trifle closer to the path of moving trains, and space is so limited that the comfort and safety of the men require as wide a separation as can be provided by the low mounting of the instrument.

In the tunnels there are 75 telephone sets, each mounted in an iron case having doors which close upon rubber gaskets to prevent any moisture from reaching working parts of the instruments. Expansion hinges are used to take up wear on the gaskets. As shown in the illustration, the all-metal receiver in this set is mounted upon a flexible metallic tube through which are run the cords connecting with the other parts of the talking circuit. Although similar sets used in mines and on shipboard have two receivers, these tunnel instruments are equipped with but one.

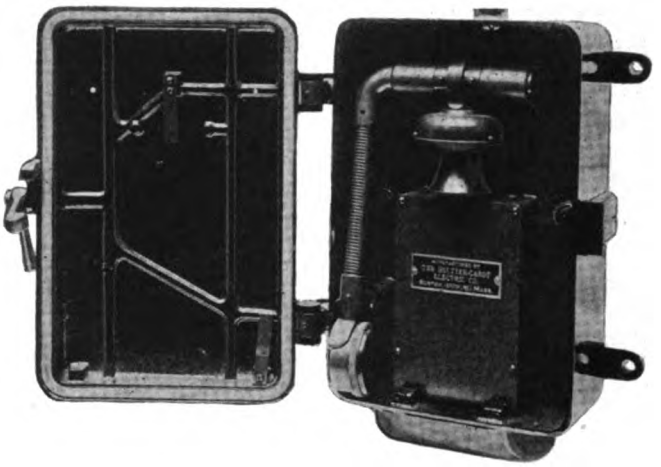
The transmitter and receiver are in fixed relation to each other, so that when the receiver is raised to the ear the transmitter mouthpiece is directly in front of the mouth. As the transmitter is moved to a talking position, the ringer is cut out of circuit by a set of springs operated in the same manner as the switchhook springs in an ordinary telephone set. The induction coil and condenser are placed in the iron box inside the casing. Ringers are also mounted in this box, the gongs being beneath the set. The object of equipping these sets with ringers is to enable officials to get into communication with the trackwalkers or other workmen in the tunnels. As before mentioned, the sets are placed at intervals of about 400 ft. and as the ringing of the gongs can be heard for a distance of 200 ft., it is a comparatively easy matter to call a person in any part of the tunnel by a ring which notifies him to go to the nearest telephone. Telephones in each section are grouped in multiple sets, so that four are rung at the same time.



A Corner in the Power Department, Showing Motor-Generator Charging Set, Ringing Dynamos and Switchboard Panel.

These tunnel telephones are principally used by trackwalkers for reporting to headquarters. As each man reports, a record of the essential points is made by the telephone operator, and any matter which needs attention is promptly reported to the proper authorities. Reports are filed with the heads of the departments and show exactly what has been done by each trackwalker.

These sets are also used in connection with the emergency boxes, which are provided for the purpose of shutting off the current on any particular section. As soon as the emergency box is pulled, a report is sent in over the telephone, telling the



The Water-Tight Telephone Set Used in the Tunnels.

reason for shutting off the current and giving other necessary information. In case of delays to trains, due to accidents in the tunnel, or any other cause, the prompt reporting by telephone enables heads of departments to get into communication with ticket sellers to prevent stations from filling up with passengers unable to go any farther, and also to take such other action as may be required. At the present time starters are located at the Twenty-third Street Station, New York, and in the Hoboken Terminal. By means of the telephone, these starters are kept advised of the arrival and departure of the trains from the terminals when for any reason a train fails to arrive or depart on schedule time. The various switchtowers are provided with telephones, and these are used principally in giving switching orders which cannot be readily understood from the signaling system. The set provided for the dispatchers and towermen consists of a small iron bellbox with a desk stand extension.

Telephones connected with this system are located in the executive offices as well as in the passenger stations, switchtowers, power house and substations, and in the tunnel itself, and thus furnish a comprehensive means of communication throughout the entire system and greatly facilitate prompt and efficient work which is so necessary for the safe handling of the large, and, at times, very dense traffic which must be cared for by such roads as this.

New Way to Cheat Telephone Companies on Toll Messages

It has just been discovered that a new kind of free toll service graft has been worked on the telephone companies of Lansing, Mich. A few days ago the traveling representative of a business concern located in a distant city came into town. He canvassed the trade industriously and landed several orders of good size. After his day's work was done, he went to the telephone and asked for "long distance." After the usual preliminaries, he called for his brother in the distant city. The brother could not be located. Well, then, perhaps the operator could get his sister. No, his sister also was out. He was sorry, but would call again later, and left the booth, without having to pay toll, of course, as he did not get his party.

The next day he departed for pastures new, and the telephone company was none the wiser. But the house had received a correct report of the business done by the drummer that day, and the toll was saved for himself or the house. The brother's name stood for the amount of his sales and the sister's for the character of the order.

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Tuberculosis Germs in Transmitter Mouthpieces

The latest contribution to the often renewed discussion of the germ contents of the average public telephone transmitter mouthpiece is that of Dr. Francis J. Allan, the medical officer of health of Westminster, in a report furnished to a recent number of the London *Lancet*.

The report covers a series of tests which indicated the presence of germs of consumption and led to the recommendations of the periodical disinfection of all telephones, whether in public or private use.

"One can scarcely picture a more suitable place for harboring organisms of all kinds," writes Dr. Allan, "than a dark telephone pay station booth, with its stagnant air and dirty floor, the dust of which is brought in from the street and stirred up and inhaled by every fresh caller.

"There is, moreover, the risk that organisms of a pathogenic character may be left behind by persons suffering from such complaints as diphtheria, influenza or consumption.

"In order to test the correctness of this assumption, Prof. Klein has been engaged in the examination of swabs taken from the mouthpieces of transmitters in public pay stations.

"In five of the six mouthpieces tested the results obtained were negative as regards tubercle, but the examination of the sixth swab revealed the presence of typical tubercle bacilli.

"As these booths are at present constructed and situated, it is difficult to imagine how in the absence of regular disinfection and cleaning they can be anything but breeding grounds for germs.

"No doubt it is difficult to construct booths which shall be efficiently ventilated and at the same time prevent outside sounds penetrating and conversation being overheard, but it ought not to be an insuperable difficulty."

The Telephone in Japan

Speaking of the government monopolies in Japan, a correspondent in Tokio of the New York *Evening Post* says: "The telephone service of the nation, another monopoly of the government, is miserably inadequate. Hundreds of applicants for telephones for years have been waiting to have their requests granted. It is said that some of these applications have been standing unfulfilled for over 10 years. The government's excuse is that the telephone bureau is already too busy; it is ceaselessly at work filling applications, and each must be content to wait his turn. It is protested that under private management the difficulty would be overcome by increasing the force of constructors and operatives, a course which would doubtless well repay the extra expense involved; and in not adopting this course the government is said to evince not only its incapacity for the management of public utilities, but its indifference to the loss and inconvenience which the public sustains thereby."

Hints on Handling Toll Traffic*

By W. B. Bentley.

Some toll lines, which are supposed to be overloaded, are constantly in use for the transmission of speech, but this is different from the forwarding of business. If managers will take the trouble to investigate, they will very often find that some toll lines are made to carry a heavy load of unnecessary talk and wrangling between operators. Some operators are over-enthusiastic about getting calls through for their own subscribers, tying up circuits longer than they should, regardless of any business the other operators have, breaking in on other circuits when in use, and interfering in various ways with the handling of business. When one particular operator I have in mind, who has a circuit cut in on a three-way jack, wants to use this circuit, she never thinks of listening in, but rings in regardless of its being busy, as it frequently is. If the circuit is busy she will keep on ringing, and cackle like a hen all during the conversation. She does this merely to annoy the parties and to amuse herself.* When this operator has a call for a distant station, her greeting to the operator when she answers is, "Hello, you old hen." In handling toll traffic the same rules and code should be used in all exchanges, no matter how small they may be. The code is like a calculagraph—it saves time and money.

One feature of toll traffic with which we shall always have to contend is the loss from cancelled calls. If the operating is handled properly it is possible to reduce the number of cancelled calls, and derive considerable revenue from the business which would be lost if the calls were not followed up. The three most valid reasons for cancellations found noted on tickets are, "O. D.," meaning, "out, do not know when party will return"; "D. A.," signifying, "does not answer"; "N. F.," meaning, "no telephone." On the first, efficient and persistent work on the part of the operator to locate the party will tend to decrease the loss of calls of this description; calls of the second class may be completed by sending for the party or calling on some nearby telephone; while in the third case, the only way is to send for the party. I have known calls to be cancelled for the last reason because the operator would say "they have no telephone," and make no further effort. Also, some operators have been known to absolutely refuse to send for the party for some reason of their own.

Again, calls have been given to the operator at a small town when her printed directory of the town called was long out of date. She looked through it, and then told the applicant that the person wanted had no telephones, and insisted on it. Some time ago, in a certain city, the operating department started to take up the completion of cancelled calls on a more vigorous plan than had been in force. Several outside stations were called on messages that had originated there, and the operator was asked to call Mr. So and So, and ask him if he wanted to talk to the party he called yesterday if he could be found. The reply from the operator at first was, "What do you take me for; I guess if he wants to talk he will call; I am not keeping books for him." All cancelled calls of the morning should be taken up in the afternoon. All cancelled calls of the previous day should be gone over and thrashed out vigorously. At least 10 per cent of the total possible loss should be saved each day.

The initial charges on all long-distance messages handled by the Missouri long-distance companies are for a period of three and one-fourth minutes. The rate on conversations is for an initial period of three minutes, and for each additional minute over the initial period overtime should be charged. Three and one-fourth minutes are considered equivalent to the initial period. Any fraction of a minute more than one-fourth at the end of the three minutes should be charged as an additional minute. Some exchanges allow one-half to one and one-half minutes and make no overcharge. This is done mostly in exchanges where they have no way of registering the time. All exchanges which do $50 worth of toll business or more a month should be equipped with a calculagraph for stamping the time. It will pay for itself in a short time.

*Abstract from paper read at the convention of the Missouri Independent Telephone Association.

*Editor's Note—This operator must be a near relative of the local "boss." In most exchanges she would receive her notice of discharge after the first offense.

A Canadian West Coast Exchange

A recent article in the *Canadian Electrical News* describes the equipment of the British Columbia Telephone Company's exchange at Vancouver. The new three story building is attractive in appearance, built substantially of brick, cement and steel. The offices of the manager and foreman of construction are located on the first floor, terminal equipment and power plant on the second, and the operating room on the third floor. Comfortable quarters are provided for operators when off duty. The operating room contains a 10,000 line capacity common-battery board, and a long distance switchboard, in addition to desks for special service.

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Equipping the Rural Telephone Lines

By G. A. Joy and J. B. Thiess.

When telephone companies were unable to get money, men and material fast enough to supply the demand for service in the towns and cities it was but natural that they should not solicit the farmer's patronage, merely accepting it when some particular community urgently pressed its claims for attention. In such instances the farmers often built very crude lines of their own, the telephone company simply supplying for each the drop at the switchboard. It is obvious that with this sort of construction the class of service available would in many cases be very annoying to the user, although far better than having no telephone. Subscribers in the town and city will not tolerate the kind of service furnished to many of their rural friends, maintaining that they can accomplish their business with greater satisfaction in person or by means of the mail or telegraph than through the channels of an unreliable telephone system. However, conditions in the country are rather different. In the first place, the farmer does not expect service of the highest efficiency, since his rates are comparatively low, and, too, his business transactions are not usually of such a nature that a delay of a few minutes will make a very material difference. Furthermore, since the telephone and the horse very frequently furnish the only means by which he can communicate with persons at a distance, it is easily appreciated that, even though the telephone service should be slow and poor, it would greatly surpass the only other available manner of conducting business. It is pleasant to note none the less that the time is rapidly approaching when it will be the exception rather than the rule to find a rural district supplied with a poor class of service, and that in many sections one finds at present a service which is very commendable.

Plans which will tend to improve the service and bring it up to the standard which farmers are learning to demand and expect, begin with the purchase of material for outside and inside work.

By the time the switchboard is cut into service, with the poles erected, wires strung and the first instruments in place, the ultimate success or failure of the system is practically settled. To make a line a success the company must start right—and this start is most likely to be made in the choice and setting of poles. The errors which can be made in this work, and their costly effects, can still be observed in many sections of the country. It was with some reluctance that the pioneers in rural service invested much money in these lines. Consequently, one finds that it was the rule at that time, and is the practice to a certain extent at present, for a telephone company to require each group of its rural patrons desiring telephone service to build a line at their own expense up to the limits of the territory in which city service is provided. This requirement was in many cases very readily consented to by the farmers, since they appreciated the benefit to be derived from telephone service, and, as they generally built the lines themselves, the expense was comparatively light. The type of construction obtained under this plan has in many instances been anything but what it ought to be, since the line was built by inexperienced hands under the supervision of men whose principal aim was to curtail expenses, resorting to any device to attain this end. Thus, we find in our Western country some very peculiar conditions, such as barbed wire fence lines. Even when the fences are not resorted to, very often pole lines are built which constitute a public nuisance. The poles used in nearly all of these lines are of native timber with the bark on and of all sizes. Then, again, they are frequently so crooked that the lineman's spur is a superfluous article.

In this connection it may not be amiss to describe briefly a line which the writers observed while driving through the country in eastern Nebraska. This particular line used poles made of osage hedge. This wood is, with but few, if any exceptions, the most crooked timber that grows, and it has the additional disadvantage of being intensly hard. To the top of each of these so-called poles is nailed a loop of insulated wire and the telephone line was strung through these loops, being draped through all sorts of foliage from pole to pole. The reader can judge as to the kind of service furnished the subscriber on this line.

Farmers owning such a line, as a rule, are eventually very glad to turn it over to the telephone company, which can maintain it as well as give service. As the maintenance of poor construction is high and service over it very poor, the telephone company almost invariably, after a few years of "kicks" and general dissatisfaction, will replace the line by one built well up to standard.

A telephone company making the change would naturally use its existing toll pole lines as far as possible, i. e., for such distance as a rural line might parallel a toll line. From the point where the lines cease to be parallel and fairly close together new construction would necessarily have to be provided. This new work will often be but a short branch and thus by using the regular toll pole line, even though it is not a direct route, the telephone company will very materially reduce the cost of construction. Accordingly this method of reaching rural subscribers is resorted to quite extensively.

In case the line under consideration is a new one, a telephone company which investigates the subject thoroughly always finds it advantageous to make use of good construction from the first, as it will be forced to it eventually. By beginning right it avoids trouble arising from the dissatisfaction of the subscriber. The subscriber is the most efficient publicity agent, and consequently his good will is a matter of grave importance and always to be considered.

Since the territory in which rural lines are strung is even now generally free from other electrical wires likely to create disturbances one finds that comparatively few of the farmers' lines are metallic circuits, the single grounded wire being resorted to in nearly all instances. These lines are known to give fairly satisfactory service unless they are carried into a town or city that is operating an electric light or railway system, in which case the line will usually be very noisy. There are two schemes by means of which this trouble may be solved. One is to make the entire line metallic, while the other is to string the line metallic for a distance well beyond the disturbing field, where it should terminate in one winding of a repeating coil, the two terminals of the other winding of the coil being wired to ground and the single line wire, respectively. Either of these schemes will eliminate the noise on the line, but the latter remedy has the disadvantage of reducing the efficiency of speech transmission due to the insertion of the repeating coil, and should not be attemped on a circuit having subscribers who are at all likely to use toll lines. Either of these plans for improving service will of necessity involve additional expense, but at the same time they are likely to pay for themselves in the long run in indirect ways, such as making it easier to get new subscribers and toll business and reducing maintenance expenses.

SUBSCRIBERS' INSTRUMENT.

Telephone sets for use in rural lines should be chosen from the instruments especially designed for this particular class of service. It has distinctive features and limitations and it is not to be expected that it can be properly handled with any kind of an instrument. Some telephone companies have the erroneous idea that the rural line is an appropriate place for setting up instruments which are too worn out or antiquated for town service instead of throwing them on the scrap heap. It is undoubtedly right and proper for the business managers to see that the waste of material is no greater than necessary, but, again, in many instances in their efforts toward economy they lose money

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for the company by operating with old and inefficient apparatus.

Some of the most essential points to be provided for in the design of the rural telephone are that the bell should readily respond to the ringing current put on the line by the operator; that the instrument shall be equipped with a hand generator of sufficient power to easily operate the switchboard signal, and that the set shall talk properly, that is, transmit and receive talking current so that the parties at opposite ends of any connection which may reasonably be established can converse with ease. These points are naturally just as essential in all other telephones, but for the class of service under consideration they are much harder to attain, and so should be insisted upon with greater vigor. High quality is demanded for instruments because the rural line is longer and of poorer construction than the city line. Then, again, one finds that there is very often a tendency to overload the country line by putting on a line as many as 25 and even 30 telephones, each one of which lowers the talking and signaling efficiency of the circuit.

As experience has proven that the permanent insertion of low wound ringer coils in series with the line gives results vastly inferior to those obtained by the permanent bridging of high resistance ringers, the series telephone will not be discussed in this article. Several different types of bridging telephones are considered to be desirable for rural telephone service, the precise choice depending on local conditions, and the personal preferences of the purchaser. The type of instrument commonly used is equipped with a high wound ringer and a standard four- or five-bar generator. The number of magnets in the latter depends to some extent on the number of telephones bridged across the line, for as the number of instruments is increased the current required to throw the drop at the exchange is correspondingly increased, as each pair of ringer coils provides one more parallel path which the ringing current will traverse, and reduces the fractional amount of the whole current which will pass through the apparatus at the end of the line.

Wiring of the calling circuit of these telephones may follow either of the two standard methods. In one type of set the apparatus is so arranged that the subscriber, upon calling central, will ring his own bell, while in the other the local bell does not respond. Some manufacturers maintain that subscribers enjoy hearing their own bell ring when calling central, but the observation of the writers seems to indicate most emphatically that this is not the case. This conclusion is based upon the fact that a subscriber will, not infrequently, place his left hand on the gongs of the instrument before turning the crank of the generator. Therefore, the writers consider well-founded a statement to the effect that the jingle of the bells is not desired to the extent that some of the manufacturing companies would have us believe. Then there is the additional disadvantage that the unnecessary ringing of the subscriber's bell furnishes another shunt circuit to generator current, thereby reducing to a certain extent the energy available for operating the switchboard signal.

There is one very serious objection to the straight bridging instrument, arising from the fact that a subscriber cannot signal the exchange without ringing the bell of every other subscriber on the line, thereby greatly reducing the current which is effective in operating the switchboard signal. Then again, since curiosity is usually fairly well developed, subscribers, many of them, upon hearing their bells ring will step to the telephone and listen, thereby making the telephone conversation anything but secret, and also very materially cutting down the transmission. This fault can very easily be corrected on a metallic circuit, among other ways, by the introduction of a grounding key at the subscriber's instrument, and the grounding of one side of the drop at the switchboard. The method and manner in which this principle is applied can be best explained with the aid of a circuit, a conventional diagram of which is shown in Fig. 1.

The operation of the circuit is as follows: Should a party at station No. 2 wish to call central, he will first depress key *K*, which will disconnect the generator from the sleeve side of the line and connect the corresponding side of the generator to ground. Consequently the current generated upon turning the crank will seek a path that can be traced from the ground at the subscriber's instrument through the generator to the tip side of the line, and thence through the break contact in the jack and the coil of the line drop to ground. Thus the coil of the line drop is energized, thereby causing its armature to be attracted, lifting the latch and permitting the drop shutter to fall. It will be observed that the other instruments do not shunt the current path traced in this circuit. Thus the subscriber signals the exchange without in any way informing the other subscribers on the line that a connection is desired. However, in case the party at station No. 2 desires to speak with another party on the same line, for example, station No. 1, he can signal this subscriber without disturbing central by turning the generator crank and allowing key *K* to remain in its normal position. This will obviously force the generator current out on both sides of the line, and it will necessarily find a path through the ringers in all the instruments on the line. Therefore, with a proper code of rings, any party on the line can call any other party on the same line without interfering with the switchboard signals.

The cord circuits of a magneto board used in a telephone system equipped with rural telephones having grounding keys should be specially designed to permit of the clearing-out drop being operated by current flowing over the tip side of the line to ground, as well as for generator current from a regular bridging or series telephone. In Fig. 1 the clearing-out drop is so arranged, the only special feature being the grounding of the central point of the drop winding. The current from any telephone provided with a grounding key will, if the key *K* is operated, flow over the tip side of the line, and thence through one-half of the winding of the clearing-out drop to ground. From a regular bridging or series telephone the current will pass through the entire winding of the drop, as neither side of the generator is grounded. In making up such a cord circuit, care must be taken to ground the drop winding at exactly the middle point, since any great variation between the respective sides of the line in the resistance from the ground out to the telephone will have a tendency to unbalance the line, thus causing it to become noisy.

It might be well to give a word of caution with respect to installation of the instruments just described, inasmuch as they must be so wired that the generator current will flow out over the tip side of the line when the ground key is depressed. If this requirement is not observed it will be impossible to signal the exchange. In Fig. 2 is shown a circuit in which the chance of trouble due to carelessness on this point is eliminated, and which is also arranged for signaling central without causing any bell on the line to ring. The operation of this circuit is as follows: When the subscriber at station No. 1 wishes to call

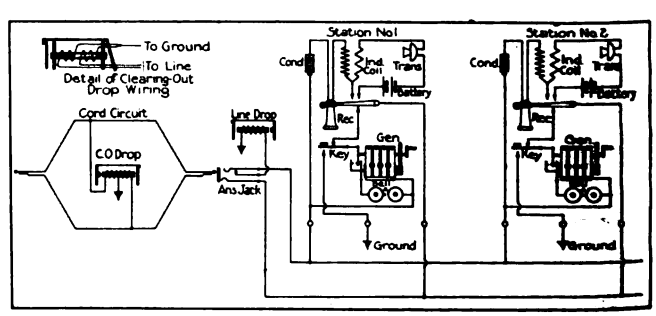

Fig. 1.—Diagram of Circuit Using Grounding Key for Calling Central.

the exchange he will first depress the grounding key *K*. This operation grounds one side of the generator and at the same time connects the other side to both the tip and sleeve sides of the line. Therefore the current generated will flow over both sides of the line in parallel, and the two windings of the line drop to ground. The coils of this drop are so connected that the magnetic energy created by the current traversing over half of the winding is added to that of the other half, so the core of the drop will be magnetized and cause the actuation of the armature.

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When one party is calling another on the same line, key *K* is left in its normal position, and consequently neither side of the generator is grounded and the current will flow out over one side of the line and return on the other wire. Therefore this current will find a path through the ringer coils of each of the other instruments on the line, as well as the line drop. The latter will not be operated, since current passes around

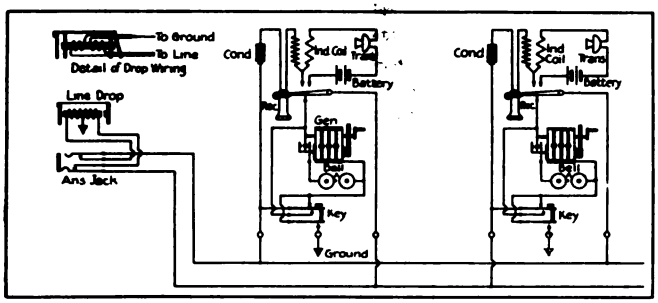

Fig. 2.—Diagram of Circuit Using a Special Grounding Key.

the core of the drop in one direction to the middle point of the coil, and from here through the other half of the winding in the opposite direction. There is no tendency to draw up the drop armature because the magnetic effect of one winding is neutralized by that of the other. It is obvious, therefore, that with this system, as well as the one previously described, the parties on the line can signal one another without disturbing the operator.

This latter scheme has several advantages over the arrangement shown in Fig. 1. In the first place, no care need be taken to connect the same side of all the telephones to the tip side of the line, and also, since both sides of the line are worked in parallel in signaling the exchange, the resistance of the path that must be traversed by the generator current is only half as large as when a single wire is used. However, with the system illustrated in Fig. 2 it is not practicable to so arrange the clearing-out drop that the subscriber can give the operator the disconnect signal without ringing the bells of the other subscribers on the line. This is due to the fact that it is impossible to operate the drop with current flowing from both sides of the line in parallel through the drop winding to ground, and also from one side of the line, through the drop windings in series to the other side of the line. The system must be arranged for either one method or the other. Since the latter plan will suffice for straight bridging and series as well as the special telephones, the cord circuit used with this scheme does not have the middle point of the clearing out drop grounded. The drop is simply bridged across the tip and sleeve strands of the cord circuit. Therefore, it is evident that, with the system just described, the party in "ringing off" will cause all the bells on the line to give a short ring, but this will be of no special disadvantage, since the calling-in signal is the one in connection with which secrecy is most essential.

(To be continued.)

Furnishing United States Weather Reports by Telephone in Michigan

One of the most practical uses to which the telephone is now put in Michigan is that of furnishing weather reports to rural subscribers. Just as the city merchants are coming to regulate the amount and kind of their advertising in the daily papers and other features of their business by the weather reports, so are the farmers, in constantly increasing numbers, coming to make use of the weather reports in regulating their farm affairs. And they are finding that the telephone for this service is far ahead of the mails and the daily papers, getting them the weather reports within an hour every morning after they are made up and reported to the main offices of the telephone companies.

When the Weather Bureau established its station at Grand Rapids, Mich., a few years ago, one of the first things it did was to get the co-operation of the telephone companies, which was freely given. Every morning, as soon as the observations are made and ready to send out, they are given to the main office, and from there the chief operators send them to the different small stations on the line. The details of getting the reports into the hands of the subscribers are left to the local managers to work out. In some places the subscribers are notified that they can obtain them by calling in for them, but in many places a prearranged call, similar to an emergency call, is in vogue, and when this call is made all those who wish take down their receivers and get the report.

Mr. C. F. Schneider, the "weather man" at Grand Rapids, Mich., accompanied some of the officers of the Citizens Telephone Co. to the recent managers' convention at Ionia, where he spoke of the obligations which the Weather Bureau was under to the telephone companies, and particularly in Western Michigan to the Citizens Company, for co-operating with the Bureau from the start, and incidentally gave some interesting information on the preparation of weather reports, and why they are bound to be of more and more importance to rural telephone subscribers.

"We get in our office," said he, "every morning, observations taken at all the Weather Bureau's stations in the United States, Canada and Mexico. These observations are all taken at 8 o'clock, Washington time, and by a rapid interchange of observations, each station soon has the readings from all these stations, so that a minute or two after 7 o'clock, Michigan time, I can tell what the weather is in Milwaukee, Chicago, Detroit, and by 9 o'clock by our time I can tell you just exactly what weather was prevailing in the United States one hour before, and I shortly have a picture before me of just what the weather is throughout the United States. From this weather map, we make our forecast."

He then described somewhat the method of forecasting, showed the growing importance of the weather reports to the farmer as the art of forecasting more nearly approaches an exact science, enabling the farmer to know what would be good market days, etc., and particularly urged upon the operators the need of getting the reports accurate—not to depend upon memory, but to take them down in writing. "The 'weather man' gets it bad enough at the best," said he, "for his prognostications as to the weather for the following thirty-six hours cannot always be absolutely correct. Meteorology is a comparatively young science, and therefore is not yet an exact science. Neither is medicine or law. A physician may not diagnose correctly more than 85 per cent of his cases. Yet medicine is a wonderful profession. So the Weather Bureau does not pretend to be infallible. But it does pretend to be of great use as professional advisers of the public on the weather. And some day our diagnosis will be right 95 times out of a hundred, and the weather reports will be of increasing greater need to the vast rural population, and the rural population will have a vastly greater need for telephones as telephones are of more use to the Weather Bureau than the rural routes. So be accurate."

Self Induction in Telephone Cables

An account is given in a recent issue of the *Elektrotechnische Zeitschrift* of the results obtained with some recent cables, in which the self induction is increased according to the method of Krarup of winding the copper conductor along its whole length with very fine soft iron wire. The amount of iron wire used has been increased in the recent cables by employing up to three layers of iron wire. One cable described has a self-induction of 0.00984 to 0.00975 henry per kilometer of double conductor. The author calls attention to the importance of dielectric losses in cables. The losses, which depend on the current, etc., cause an increase of effective resistance with increasing frequency, while the losses depending on the voltage cause an increase of the effective leakage. The importance of this latter fact is pointed out.

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The Manufacture of Electrical Condensers*

By G. F. Mansbridge.

For convenience of description, the various types of condensers are considered separately. They fall naturally into four chief classes, namely, 1, mica; 2, glass; 3, paper or other fibrous material impregnated with wax, resin, oil, etc.; 4, electrolytic cells.

MICA CONDENSERS.

On account of the very high cost of mica sheet suitable for the work, condensers of this form are but little used.

Mica condensers, when well made, retain their capacity and insulation better than those made of paper, and they have also a higher dielectric strength for the same thickness, but the cost per microfarad is approximately 10 times greater than that of paper condensers. Fortunately, the inductive capacity of mica is high (about twice that of paraffined paper), or the labor cost would be excessive, since the size of the sheets is limited to about 4 in. by 3 in., the cost of larger sheets of uniform thickness being prohibitive. A good working thickness is 0.0015 to 0.002 in., and if the material is carefully selected there is no necessity, for ordinary purposes, to use more than one sheet between consecutive foils. For purposes where mechanical strength in the condenser plate itself is of special advantage mica is very satisfactory, and for standards it is unrivalled. In standards the chief desiderata are:

(1) Constant capacity with efflux of time.
(2) Constant capacity with varying temperature.
(3) High insulation and low absorption.

To obtain (1) it is necessary that the mica and tinfoil sheets be perfectly flat and free from inequalities, so that they will build up under pressure into a solid mass without flexure or mechanical strain; it is also necessary that in assembling the sheets all air-bubbles be excluded.

To obtain (2) advantage is taken of the fact discovered by Dr. Alexander Muirhead that the mica sheets have a positive temperature coefficient if coated with shellac, and a negative temperature coefficient if coated with paraffin. By building a condenser in two sections, one treated with shellac and one with paraffin wax, the variation of capacity within ordinary limits of temperature can thus be brought practically to vanishing-point.

To obtain (3) it is necessary to use only selected sheets of the finest clear "ruby" mica, which must be uniform in thickness throughout the sheet, and free from cracks, veins, or flaws; spotted or "speckled" mica is useless for the purpose. The shellac employed should be the finest button lac dissolved in absolute alcohol and carefully strained until perfectly free from suspended matter. The building up or assembling of the sheets of foil and mica may conveniently be done on a "hot plate," the greatest care being taken to exclude air-bubbles, grit, or excess of paraffin or shellac. The desiccation should be slow but thorough, and the temperature should not exceed 212 deg. Fahr. The finished condenser should be carefully and not excessively pressed, and should be allowed to cool under pressure in the ordinary way.

GLASS CONDENSERS.

A few years ago the Leyden jar would not have called for comment in a "practical" paper, but the requirements of wireless telegraphy and X-ray work have latterly increased the importance of apparatus of this character, and there is now quite an appreciable trade in glass jars for this specific purpose. As is well known to wireless workers, Leyden jars, like other condensers, are prone to fail in use if at any point there is imperfect contact between the conductor and the dielectric, and to avoid this difficulty the best plan is to silverplate the glass. This may be done by precipitating metallic silver on to the glass in the form of a bright, continuous film by the well-known method employed for silvering galvanometer mirrors, etc. The solution generally used is nitrate of silver which has been treated with ammonia until the precipitate first formed has been completely re-dissolved. The surface of the glass must be cleaned with the most scrupulous care before plating is attempted, or an imperfect coating will result. The silver coating should then be mechanically strengthened by a protecting layer of varnish, or it may be over-plated with copper.

CONDENSERS WITH PAPER OR OTHER FIBROUS DIELECTRICS.

Although this form of condenser has been employed for many years, there have been but few important changes in the process of manufacture until lately. The standard practice up to the last decade was to use separate sheets of tissue paper and separate sheets of thin metallic foil, and the method employed was to dry the paper by heat, then to transfer it to a bath of hot paraffin wax, and after due soaking to build up the condenser on a "hot plate," the paper being taken sheet by sheet from the bath of hot wax. At least two sheets of paper were used between consecutive foils, the alternate foils being bunched into two books in the well-known way. The paper used was of fine quality, giving only a minute percentage of ash on incineration, being free from grit, holes, specks, etc., and being neutral in chemical reaction. A good working thickness was 0.001 in. The metal foil was usually of tin, the thickness being about 0.0003 in.

Obviously this method of building condenser plates was slow, tedious and expensive, and it had the further disadvantage that as the workmen who handled the material were exposed to a high temperature, the risk of contamination of the wax by emanations from the body was great; indeed, the difficulty was such a serious one that the manufacture of satisfactory condensers in very hot weather was practically impossible, and in London it often became necessary, on this account, to cease manufacture during the summer months. Even in cooler weather it was necessary to select workmen who were not prone to perspire freely, as only such men could be depended upon to produce condensers with satisfactory and permanent insulation. In consequence of this difficulty, the author found it of advantage to build up the condenser plates "dry" in a separate room and to desiccate and impregnate the condensers as a subsequent operation. By this arrangement practically all the handling was done under more favorable conditions in a cool shop, and the electrical results obtained were more satisfactory than under the old system, and at the same time the cost of manufacture was considerably reduced. The slow process of assembling the sheets one by one and of handling about 250 separate pieces to make up a 1-microfarad plate had, however, still to be reckoned with, and the percentage of failures through short circuit or low insulation was considerable, so that the labor cost remained an important factor.

The next step was in the direction of bringing down this high labor cost by reducing the number of pieces to be handled. The method adopted was to wind up into the form of a roll long strips of metal foil, two strips of paper being interposed between each foil—that is, six strips in all. This method, which was introduced to the postoffice by Sir John Gavey in 1899, had, however, difficulties of its own. Pure tin foil of the requisite thinness could not at that time be obtained in strips longer than a few feet, and the alternatives were: (1) to feed between the rolls of paper a series of strips of pure tin foil some 4 ft. long, each strip overlapping its predecessor by an inch or two so as to maintain continuity; or (2) to use an alloy of lead and tin which could be obtained in continuous lengths. The former was an awkward and unmechanical arrangement, and the latter had the disadvantage of producing a heavy and bulky

*Abstract from paper presented at a meeting of the Institution of Electrical Engineers, Great Britain.

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condenser. Both methods also involved a considerable proportion—rarely less than 10 or 15 per cent—of short circuits in the finished plates brought about by grit in the foil or by defects in the paper. In endeavoring to overcome these difficulties, the author hit upon the idea of using metallized or "foiled" paper of the same character as that sometimes employed for wrapping up packages of tea, etc. Experiments showed that commercial "tin-foiled paper" as then made was not sufficiently reliable as an electrical conductor for the purpose; indeed, many samples, although having apparently an excellent metallic surface, were found to be almost as devoid of conductivity as paper itself. Microscopic examination revealed that this want of conductivity was chiefly due to the tin being distributed, not as a continuous film over the surface of the paper, but in small isolated patches, the breaks between the contiguous patches being due to small fibers of the paper standing above the average level. Further, it was found that even in those samples which gave fair conductivity in the plain sheet very little creasing of the paper sufficed to destroy the continuity. The matter was, however, considered sufficiently promising to warrant careful investigation, and the difficulties in the way of producing a thoroughly reliable conducting surface on such paper were found to be surmountable.

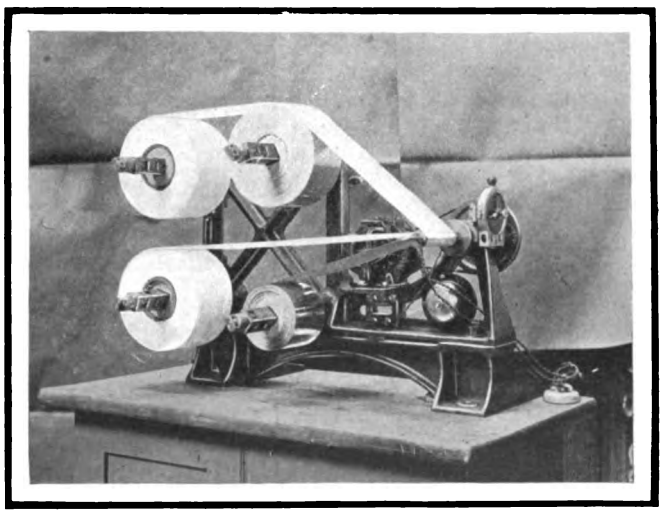
For assistance in carrying this part of the work to a successful issue, the author desires to express his indebtedness to Messrs. Olive & Partington, Ltd., of Upper Thames Street, London, who gave the matter considerable technical attention at their works and who were the first to produce foiled paper for electrical purposes on a commercial scale. As soon as supplies of good electrical foiled paper became available the manufacture of condensers on this principle was taken up by the postoffice, and subsequently by various commercial firms, under license from the patentee.

As is well known, metallic tin may be thrown down from its solution either chemically or electrically in the form of an impalpable powder, and the preparation of the finely divided metal is the first process. The ingot tin—previously granulated or "feathered"—is dissolved in nitrohydrochloric acid, and after all scum and insoluble matter have been removed, the solution is diluted and the tin is carefully precipitated by metallic zinc, or by the action of a weak electric current. For the best results the most minute subdivision of the tin is essential since only the thinnest layer of metal is desired, and unless this layer is uniform, metal will be wasted or imperfect continuity will result. After precipitation the powder is repeatedly washed to free it from all traces of acid, and is sifted through sieves of the most minute mesh so as to eliminate all large particles of tin or any grit with which it may have become contaminated. A suitable adhesive such as size is added, and the tin mud is then passed to the coating machines. These are provided with mechanical stirrers to prevent the metal settling, and with rotating brushes and spreaders to distribute the metal evenly over the surface of the paper as the latter passes through the machine. In some machines the paper is passed over heated cylinders so as to dry the coated surface quickly, but as this is liable to reduce the efficiency of the adhesive it is preferable that paper for electrical purposes should be dried more slowly—for instance, by exposure to currents of warm air. The dried paper then presents a dull gray appearance, and microscopic examination shows that the surface is covered by a magma of minute crystalline particles forming a layer of appreciable depth. The paper then passes to the burnishing rolls which consist of heated heavy steel calenders or friction rollers between which the paper is fed. These friction rollers compress the dull magma of tin powder into a coherent thin film having the luster of the polished metal. During this process any comparatively large crystals of tin or particles of grit which may have escaped untrapped will be driven partly or wholly through the paper, but the effect of this is eliminated by the subsequent electrical treatment, as described later on. The paper is now passed to the slitting machines where it is trimmed and cut to any desired width.

It is interesting to note that prior to the calendering process referred to, the film of tin powder is non-conducting, the conductivity being produced by the action of the steel burnishing cylinders which so consolidate the coating as to bring the particles into intimate contact each with its neighbor. Perfect contact between every particle of tin and its immediate neighbors can hardly be expected, but in view of the entire want of conductivity before calendering, it is perhaps surprising that in properly calendered foiled paper, with a fairly heavy coating, the conductivity of the coating may be as much as 50 per cent of that of a continuous strip of pure tin of equivalent weight. On the foiled paper as usually made for condensers, the quantity of tin averages 25 grains to the square foot, and the conductivity is about 25 per cent of that of pure tin, the resistance of a strip 1 ft. wide averaging 0.3 ohm per foot run, that is, 0.3 ohm per square foot or per square meter. This density of coating gives a surface of 280 sq. ft. to the pound of tin, or say, 57 sq. meters per kilogramme of tin. The average thickness of the tin film is therefore as nearly as possible 0.0001 of an inch, or say, 0.0025 mm. Seeing that the material is semi-transparent, the current-carrying capacity of this film is surprisingly high, the fusing current in air being rather more than 1 amp per inch of width for the standard coating of 25 grains per square foot; this is assuming that the paper has not been creased. Bending the paper round even a very small radius does not affect the continuity, but if the paper be very closely folded back on itself so as to put the film sharply in tension or compression, a certain amount of disintegration follows, and the fusing current is correspondingly lower. By using a greater density of coating, say, 40 grains per square foot, the effect of creasing is greatly diminished, but there is no necessity for this higher density in condenser work since the creases in the rolled condenser even at the center of the roll are not very sharp.

Continuous reels of electrically-conducting foiled paper being available, the manufacture of a condenser is a very rapid and simple operation, since all that is necessary is to roll up together two strips of foiled paper, interleaved with two strips of plain paper, the number of turns being dependent on the capacity required.

The foiled papers may be placed with their metallic sides facing each other, but separated by the two plain papers, in which case the two body papers form the dielectric on the opposite side, or, alternatively, the papers may be arranged so that the dielectric on each side is made up of one body paper and one plain paper. The latter plan is preferable, as it gives a more even distribution of the dielectric strain. Interleaving paper is invariably used for telegraph or telephone condensers, since the insulation, otherwise obtainable, is but a few megohms. The machine usually employed for the rolling operation accommodates two reels of plain and two reels of foiled paper, and is provided with a set of interchangeable winding mandrels of



The Electrically Driven Condenser Winder.

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various diameters. The winding of the strips on to the mandrel is usually done by hand if the number of turns per condenser is small, but in some instances more than a hundred turns have to be wound on, and the mandrel may then be power driven with advantage, but in this case a mechanical counter becomes essential. The placing of the strips in position and the starting must be done by hand, and this also applies to the insertion of the connecting lugs, which should be strips of annealed copper foil, about 0.001 in. thick and ⅜ or ½ in. wide. These strips are simply slipped into place between the foiled surface and the interleaving paper, and are so light that they readily retain their position; they should make contact with the foiled surface over practically its full width and should protrude about 1 in., so as to serve subsequently as a soldering point for the wire connection. The two lugs should be placed at the middle of the foiled strips rather than at the beginning or end, so as to avoid interposing any appreciable resistance into the condenser circuit. This plan has the additional advantage that thereby the innermost layers, which possibly may have been rather sharply creased, are not called upon to transmit any considerable current on charge or discharge, as would be the case if the lugs were placed at the inner end of the roll.

(To be continued.)

Rainy Season Trouble Hunting in Arkansas

By A. E. Dobbs.

Eastern Arkansas, with the exception of a narrow range of hills rising from the Mississippi River bottoms, is low and flat up to and beyond the White River with its numerous tributaries. Drainage is poor, and during the rainy season there is always a great deal of water on the surface of the ground. Under these circumstances poles, unless very well set, show a strong tendency to topple over. Trouble hunting involves difficult traveling, as a light buggy carrying two men with their tools will often sink to the hubs in the muddy roads. The writer's attention was recently directed to an experience in trouble shooting during the rainy season which illustrates the difficulties sometimes encountered. Two men started to locate a trouble on a grounded line following one of the crooked "bottom" roads. The first five miles was over a fairly good road, but when a point where the wire crossed a bayou was reached it was necessary to tie the horse and follow the line in a canoe. Eventually two breaks were found, one of them being at a river crossing. The only way to repair it was to carry one end of the wire across the river in the "dugout." A new span, run 20 ft. above high water, was cut in and the branches trimmed to leave it clear. Further repairs were found to be necessary, and to reach the breaks the only mode of travel was to alternately paddle the canoe and drag it over shallow places in the road. With trouble "shooting" carried on under these circumstances the advantages of good construction and the probable result of charging too low rates are obvious.

Large Straight Multiple Board at Budapest

The single central office in Budapest, Hungary, which has a population of about 800,000, including suburbs, is being increased to 18,000, and part of the extension is already in use. This is probably the largest straight multiple switchboard in the world. It is common battery with 10 panels to a section. It is intended to apply message rates in Hungary as soon as the necessary legislation can be passed through the Parliament.

Measured Service In Germany

Consul-General Richard Guenther, of Frankfort, Germany, reports that the German Postal Department, which owns and operates the telephone system of the Empire, except in Bavaria and Wurtemberg, proposes to introduce a measured rate system of charging. At present each subscriber pays a yearly flat rate.

Method for Determining Percentage of Tin in Lead Sheathing of Cables*

By Henry W. Fisher.

The method about to be described is a specific gravity one, and was worked out many years ago in the laboratories of the Standard Underground Cable Company, and it has been found to give good practical results in determining small percentages of tin such as are used in the sheathing of cables.

The samples of alloy must be first thoroughly cleaned and the specific gravity tests made with the greatest of care, using a good analytical balance. A test of this kind can never be taken as conclusive because errors may be introduced in several ways. Hence, the regular chemical test is really the only reliable one.

The theory and formula are as follows:

Let x = the weight of the lead in the sample,
" y = the weight of the tin in the sample,
" w = the weight of the sample in air,
" w' = the weight of the sample in water,
" a = the specific gravity of lead,
" b = the specific gravity of tin,
" c = the specific gravity of the sample,

Then $c = \frac{w}{w - w'}$ (1)

Cubic contents $= \frac{\text{weight}}{\text{specific gravity}}$ (2)

Cubic contents of lead $= \frac{x}{a}$ (3)

Cubic contents of tin $= \frac{y}{b}$ (4)

Cubic contents of alloy $= \frac{x}{a} + \frac{y}{b} = \frac{w}{c}$ (5)

But $x + y = w$ (6), therefore, $y = w - x$, (7)

and equation (5) becomes $\frac{x}{a} + \frac{w - x}{b} = \frac{w}{c}$ (8)

from which we get $x = \frac{a\,w\,(c - b)}{c\,(a - b)}$ (9)

and $y = w - x = \frac{b\,w\,(a - c)}{c\,(a - b)}$ (10)

The percentage of tin $= \frac{b\,w\,(a - c)}{c\,(a - b)} \times \frac{100}{w} = \frac{b(a - c) \times 100}{c\,(a - b)}$ (11).

For lead and tin formed under pressure,

$a = 11.381$ and $b = 7.371$ which substituted in equation (11)

gives the percentage of tin $= \frac{2092}{c} - 183.81$ (12)

For cast lead and cast tin,

$a = 11.352$

$b = 7.36$, substituting in equation (11) we get

the percentage of tin $= \frac{2093}{c} - 184.36$ (13)

For every degree Fahrenheit, the specific gravity of the alloy increases .00127. The specific gravity of the alloy must be corrected to 70 deg. F. and this result used in formula (12). It is a well-known fact that metals do not always unite in conformity with theory, and to compensate for any discrepancy due to this cause, the specific gravity of a pure lead pipe formed under hydraulic pressure was first determined and then the specific gravity of several samples of pipe containing tin and lead were found and also, by means of a chemical test, the exact percentages of tin and lead. By substituting in equation (11) the values obtained for (b) the specific gravity of tin under pressure was obtained. This determined value of (b) may not be the actual specific gravity, but its value satisfies the general equation for small percentages of tin and, of course, the formula is only strictly correct for amounts of tin approximating 3 per cent, which is a value frequently specified. I have never had occasion to test the formula for large percentages of tin, and in fact there is no need for doing so in the cable manufacturing business.

*A five minute talk to the Pittsburg Section, American Institute of Electrical Engineers.

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The Largest Telephone Directory in the World

Employees of the New York Telephone Company and the New York & New Jersey Telephone Company, which operate the telephone service of New York and vicinity, have recently been distributing the summer telephone directories, the total edition of which exceeds one million. At the time the new directories are distributed, the old ones are collected in order that the old directories, which have become incomplete and incorrect, due to changes of telephone numbers and new installations, will not be used. Correct directory information is essential to good service, and consequently the telephone companies call in their old directories whenever they distribute a new edition. In view of the size of the present summer edition, this means that over 2000 tons of paper will have to be moved by the companies' distributing force.

The telephone directory of New York and vicinity has become a very important book, for it is not only the hand-book of the telephone user, but it has also become the general directory of the city, and is consulted by hundreds of thousands of people daily, who look in the book to find names, addresses, street numbers, etc.

There are in New York and vicinity at the present time approximately 450,000 telephones. The scope of the book, which contains the listings of practically all of these telephones, can be readily seen.

In 1879 the telephone list of New York was printed on a small card and contained the names of only 252 subscribers. Since that time, with the rapid growth of the telephone business, the book has been rapidly growing in size, the book of February 10 of this year being nearly a foot square, with over 800 pages and weighing over three pounds. This overgrown book was so unwieldly to handle, and the physical difficulties of printing and distributing such a book were so great that the telephone companies worked out a plan of dividing the directory into smaller volumes, which are more easy for subscribers to handle, and which makes directory information more easily obtainable.

Under the new plan, subscribers in New York City receive a New York City directory, which contains the listings of telephone subscribers in the five boroughs of New York City, these listings to be in three separate alphabetical groups: Manhattan and the Bronx, Brooklyn and Queens and Richmond; and also a general suburban directory, which contains the listings of telephone subscribers in the suburban sections of the metropolitan telephone area as follows: New Jersey, Suburban Long Island, Westchester County and Rockland County. Each group is a complete alphabetical list of all telephone subscribers in that section.

Subscribers in the suburban territory receive a New York City directory and a suburban directory, containing the listings of all subscribers in or adjacent to the particular suburban section in which the book is distributed. All subscribers in the section are listed in one alphabetical group.

In addition to these books, each suburban town is provided with a small local list. These local directories, which have been issued formerly in only a few suburban towns, have been found most convenient, and, accordingly, arrangements have been made to issue them in all towns throughout the suburban area.

The New York City book and the general suburban book are a trifle larger in dimensions than the present directory, but do not contain as many pages, and will be easier to handle. The type pages of the new books have been designed with care, and although the type face is of necessity small, it is exceptionally clear and legible. The pages being a little wider, give more space for a margin, which is an improvement.

In the new directory the listings of the telephone numbers of the various city departments have been rearranged, all listings appearing in one group under the general caption, "City of New York." Up to the present time the listings of the various departments, bureaus, board and commissions of the city government have been listed under separate headings, the listings being scattered throughout the book. The new arrangement of listing these various departments under the general caption, "City of New York," is a great improvement over the old method, as all the New York City department listings are in one place, and thus can be found more easily.

A new feature of the suburban directory is the elimination of the local town headings, all subscribers in a suburban section, such as New Jersey, for instance, being listed in one alphabetical listing group. It is felt that this method will be a great improvement over the old way of listing subscribers of each little town under the town heading. With a number of small communities throughout the suburban area it is difficult to remember and find in the present telephone directory the exact town heading under which the person to be called is listed. With all subscribers in any given area listed in one alphabetical group this difficulty is obviated.

The telephone companies maintain a special directory department, where twenty expert copy makers are constantly employed under the supervision of the directory manager. To this department daily reports of all new and changed names for the directory are forwarded, and from these reports copy is made for the printer. This copy is forwarded every day, and a small supplementary list of telephone directory changes, called the addendum, is printed each day and furnished to all of the central offices throughout the territory, in order that information desks of the central offices may have the latest directory information.

The printing of the directories is a stupendous job and requires a very large and a specially equipped printing establishment. When a new edition of the telephone book goes to press, the shop works day and night, Sundays and holidays, in order to get out the directories with the least possible delay.

The New York City telephone directory is in 24 signatures or sections, and is printed on a specially made Hoe press, which turns out 7500 printed sheets of 144 pages each every hour, all properly folded in book form. Each section is transferred from the press to the gathering machine, where all are brought together and stitched, making the book ready for the covering machines. A covering machine, which automatically attaches covers, will cover approximately 1600 books an hour.

The distribution of the edition of telephone directories to subscribers is another big job and requires a small army of men. In Manhattan and the Bronx alone some 400 men, with 20 trucks and a large number of small delivery wagons, are employed doing delivery work. The method is to ship the books in quantity to various points throughout the city. From these points the men carry out the books to subscribers, leaving the new directories and collecting the old. A receipt is obtained for all directories delivered. In the suburban sections, the directories are delivered by means of delivery wagons, of which about 100 are in use during the directory distribution period.

Telephone Dispatching Being Considered by the New Haven Railroad

The substitution of the telephone for the telegraph in train dispatching service is reported to be under consideration by the New York, New Haven & Hartford Railroad. The nine-hour law for telegraph operators, which has increased the pay-roll account and the payment of heavy toll charges for leased telegraph wires, are primarily responsible for the present consideration of the problem.

Rocky Mountain Forest Reserves.

A contract has been made recently by the United States Government with the Rocky Mountain Bell Telephone Co. by which the 1300 miles of telephone line strung through the national forest reserves by the government in the Rocky Mountain region will be connected with the lines of the company. Settlers along the government line will be allowed to make connections with it, provided they build from their homes up to the government line.

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Restrictions on Consolidation

Will you tell us what shape the restriction on consolidation takes in Alabama, and where it can be found.

The constitution of Alabama contains the provision that no telegraph company shall consolidate with or hold a controlling interest in the stock or bonds of any other telegraph company owning a competing line or acquiring by purchase or otherwise any other competing line of telegraph. Article IV, section 11. In Alabama the word "telegraph" includes "telephone" as well.

Memphis Rates Are Reasonable

According to the decision of Federal Judge Walter Evans at Louisville, Ky., the present rates charged by the Cumberland Telephone & Telegraph Company in Memphis, Tenn., are reasonable, and the plant could not be operated at a profit upon smaller charges. This invalidates the ordinance of Sept. 24, 1907, introduced by E. H. Crump, now fire and police commissioner, while he was a member of the board of public works. It made a rate of $5 per month, payable in advance, for business instruments, and $2.50 a month, also payable in advance, for residence telephones, and allowed 50 cents a month for delinquency. Mr. Crump offered to pay at the rate provided by his ordinance, and it was refused by the telephone company. He then secured an injunction from the Chancellor restraining the Cumberland company from taking out his residence and business office instruments, because he had not paid the old rate.

The telephone company then went to the Federal court and secured an injunction which restrained the city officials from attempting to enforce the provisions of the Crump ordinance. Upon motion of the company to make the injunction perpetual, the decision of Judge Evans was made. The present rates of the company are $7 per month for business telephones and $3 per month for residence instruments.

Telephone Poles Not a Nuisance Per Se.

Where telephone companies have a right to erect their poles in the highway, subject to the reasonable regulations of the highway commissioners, the presence of a telephone pole along the side of a highway is not an obstruction constituting a nuisance *per se*. This was decided in a case where a man, driving near Casper Creek bridge, Poughkeepsie, N. Y., was injured and alleged that his injuries were caused by the defective condition of the highway. He sued the town of Poughkeepsie for damages. Two telephone companies duly organized, had erected poles about 3 ft. from the guard rail and 13 ft. and 17 ft. respectively from the northern abutment of the bridge. The poles were originally set in a grass plot at the side of the traveled way, from 1 ft to 20 in. from the traveled portion; subsequently a rural free delivery box was placed on one of the poles, and the delivery man, in driving up to deposit mail, had worn the grass away from in front of these particular poles. The plaintiff was driving across the bridge at about 11 o'clock in the evening in a thunder storm; in driving to avoid collision with an automobile, he pulled his horse to the side of the highway, and his wagon collided with one of these telephone poles. The question in the case was whether the highway commissioners were negligent in allowing the poles to remain where they were situated. The court held that they were not liable, as they are merely required to use reasonable care to see that the highways are reasonably safe for travel, and a test of their duty is whether a man of average intelligence and precaution would have considered that the situation was one of danger to a traveler using ordinary care under the circumstances. Therefore a judgment for the plaintiff was reversed.

Schofield vs. Town of Poughkeepsie, 107 N. Y. S., 767.

Gross Earnings Tax Applies to All Income Sources

At Minneapolis, Minn., Judge Andrew Holt, of the Hennepin County District Court, handed down a decision in the case of the State of Minnesota vs. the Northwestern Telephone Exchange Company in which he finds that the State is entitled to recover $1,481.16 in addition to the tax paid as a gross earning tax under the law, for the year 1904.

The defendant company paid 3 per cent tax upon its gross toll earnings within the State, but not upon its other sources of income. The attorney general forced the issue by claiming a proportionate amount of interstate earnings, also taxes on investments held by the company and messenger and booth service.

The court finds that there was an item of $36,252 of interstate business, $25,301 collected for service for other companies located outside of the State, $6,494 for messenger calls, $5,000 from booths, an item of $33,000 for sales of telephone poles, $12,157 interest on securities that are not a part of the operating system, and $13,275 free service for charity and public buildings. In all the court allows $49,372 for taxation. It eliminates the free service as a charge because in 1904 there was no law against free telephones. The case will be carried to the Supreme Court.

Telephone Users Must Be Satisfied with Reasonable Service

At Petersburg, Va., Judge Mullen, of the Hustings Court, in a written opinion in the case of Frank G. Scott against the Petersburg Telephone Company denied the plaintiff's motion for an injunction enjoining the defendant company from stringing a telephone cable in front of his lot in High Street. The plaintiff in his petition averred "that to permit the defendant to do this would be an unwarranted invasion of his rights of property, against or for which no action at law could adequately protect or compensate him." The opinion of the court defines the contentions of both sides, the rights of abutting property owners and the manner in which a corporation may acquire the use of a public highway. It says that the stringing of a cable in front of the complainant's enclosure can work no perceptible damage or injury; but if it did, it is clear that the defendant could do so under condemnation proceedings, even if it imposed an additional burden. "If," says the court, "the people of High Street desire telephone service and demand it at the hands of the defendant they should be content with such service as the defendant can reasonably give them and with such as the people in other equally as attractive localities are satisfied with."

An Uncollectible Corporate Assessment

At Binghamton, N. Y., an assessment of the Delaware County Telephone Company has been held uncollectible because levied contrary to the provisions of the by-laws. This was done by a decision of County Judge Parsons after an appeal from the adverse judgment made by a justice of the peace. The suit was brought to recover $11.30 claimed to be due as the assessment, like amounts being due from many other stockholders of the company. The by-laws were found to provide for an assessment where there was no money in the treasury to meet outstanding obligations, but the assessment in question was levied to meet the cost of repairs and extensions to be made in the future, and hence not within the purpose authorized by the by-laws.

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Words Spoken Over Telephone Cannot Be Breach of Peace

At Winona, Minn., it has been held by the Municipal Court that no action lies for breach of peace where the words were spoken over a telephone, although such words would be actionable if spoken directly to the person addressed. The reason given is that by the time the person offended had reached the person speaking, he would have time to cool off. The action was brought because of abusive words alleged to have been spoken by Lawrence Kreidermacher to Mrs. Mary Simon over the telephone.

Constructive Notice to Linemen of the Grounding of Live Wires

It is held by the Supreme Court of Michigan that a telephone lineman is charged with constructive notice of the grounding of live telephone wires, and that he assumes the risk of danger caused by the contact of the wire he is stringing with wires carrying heavy currents of electricity. This decision was rendered in a case where a lineman brought action to recover for injuries received in stringing wires for a telephone which the company had directed him to put in. He alleged that the company was negligent in not furnishing him a sufficient number of competent fellow-servants, proper insulated copper wire, suitable hand lines and reels. He had done similar work before with other men, but never had charge of such a job alone, and testified that he had never appreciated any danger from such work. He stated that he thought he was insulated because he was upon a dry cedar pole. One of the company's experts testified that, in his judgment, the lineman got in the most dangerous position in doing his work that he could, except to lie on the cross wires, and that unless he was trying to commit suicide, he had little apprehension of the danger he was in and was wholly incompetent to do that kind of a job. The accident happened because of the wires he was among coming in contact with highly charged trolley wires. A judgment for the plaintiff was reversed by the court on the ground that he knew those things with reference to the creating of grounds and circuits which a telephone lineman must necessarily know in order to conduct his business with any degree of safety whatever to himself, his employer or his co-employees. It was further held that he must have had knowledge of the grounding of the wires, as it was an essential fact in the business.

DeKallands vs. Washtenaw Home Tel. Co. (Mich.), 15 D. L. N., 337.

Cuban Telephone Law

Governor Magoon, of Cuba, has addressed a letter to the municipalities of the island asking for a full expression of opinion regarding the proposed telephone law which has been framed by the Law Advisory Committee, and also an expression as to whether the municipalities deemed immediate action necessary. The municipalities so far heard from seem to have expressed themselves as in favor of suspending immediate action. The city of Matanzas asked that during the present intervention no telephone concessions, or any other public service franchises be granted, this request being in accordance with the terms of the Foraker bill passed by the Congress of the United States, prohibiting the granting of franchises by the Cuban government.

Practical Questions and Answers*

Unusual Result of Grounded Line (1048)*

We have connected with a P. B. X. board one line which is giving us peculiar trouble. The blue print circuits of the board have been lost, but from inspection of this board and my knowledge of others of the same make, I am very sure that it is wired like the enclosed diagram. This particular line gave no trouble until recently, when it became grounded. We detected the ground by the noise, which was not bad. But the ground did not light the lamp, so it must have been on the tip wire. The party could light the line lamp by taking the receiver off the hook, and the operator could ring that station all right. But when the operator plugged in to answer the line, it went dead. The inspector said that when he went to the telephone and put the receiver to his ear, the side tone came up loud and good. But when the operator plugged in his side tone went dead, although he could hear the operator. He could not supervise by working the hook. The operator said that the supervisory lamp was dark at that time. Can you make any suggestions as to why a simple ground would act that way, when it never did it before?

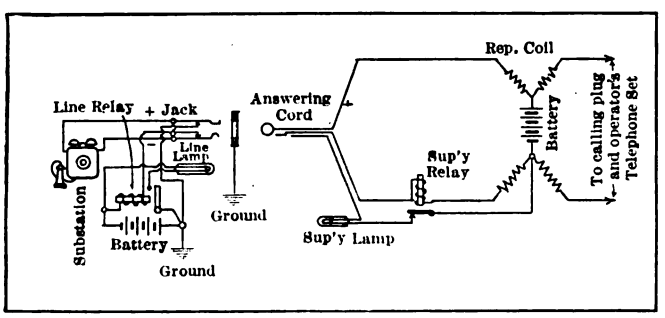

Fig. 1048a.

The sketch to which reference is made is shown in Fig. 1048*a*. It will be seen that it is a simple common battery board in which the line signal is cut off by inside contacts in the line jack. The tip is connected to positive battery, which is grounded. You are right in assuming that if wired in this way a ground on the ring side would light the line lamp, while one on the tip would not. The latter would also not interfere with supervision, nor with talking to any great extent, except to make the line noisy. The fact that the ground brought on such unusual actions leads to the conclusion that something else is wrong besides the ground. The reversal of the line signal wires, + and —, will produce the results which you describe, provided your line ground comes on the ring side. Thus, the ground would not light the lamp, for both positive (ground) battery and the leak are both on the same wire. The condition obtaining when the operator plugs in is shown in Fig. 1048*b*. The leak or ground must have been heavy, so that it acted as a short circuit on the telephone. This killed the side tone and the possibility of the subscriber's talking, for there was no battery current for the transmitter. But he could still hear the operator to some extent through the tip quarter of the repeating coil. Supervision would be prevented because a steady current would flow through the leak, back on the ring line, through the supervisory relay, repeating coil, to battery, keeping the lamp dark regardless of the substation. A receiver or voltmeter test will show if your line is thus reversed.

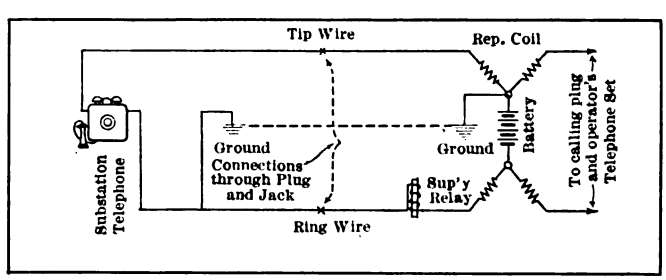

Fig. 1048b.

*Replies to queries in this issue are furnished by Arthur Bessey Smith, Asst. Prof. in Telephone Engineering, Purdue University.

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Voltmeter to Measure Capacity (1049)*

I wish to know if the voltmeter can be used to measure the capacity of condensers. If it can, how accurate is it?

While the voltmeter is not designed for this class of work, and is not to be considered if accuracy is desired, yet it is possible with the proper instrument to get fairly good results, at least enough to show what a condenser is intended for. The

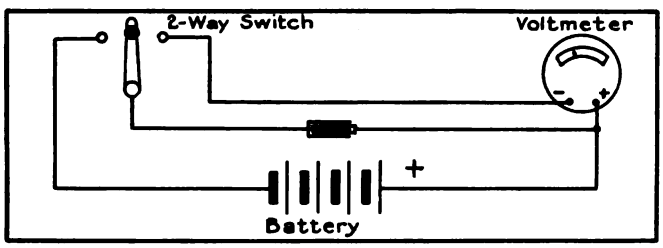

Fig. 1049.

writer has made some tests with condensers and a wire chief's voltmeter in the telephone laboratory of Purdue University. These are as follows:

A circuit was arranged as in Fig. 1049. The condenser was first charged from the battery, and then discharged through the voltmeter, which had a 4 and a 40-volt scale. Three condensers each marked "2 M.F." were numbered 1, 2, and 3.

The deflections in the second column were obtained from the highest throw of the voltmeter needle. The third column is the sum of the individual readings on the condensers which have been put in parallel.

With 40-volt Scale.

Cond. No.	Defl.	Calculated Defl.
1	3.75	
2	4.25	
3	3.75	
1 and 2	6.50	8.00
1, 2, and 3	8.00	11.75

With 4-volt Scale. 22-volt Battery.

Cond. No.	Defl.	Calculated Defl.
1	.450	
2	.525	
3	.450	
1 and 2	.975	.975
1 and 3	.915	.900
2 and 3	1.000	.975
1, 2 and 3	1.425	1.425

In this case the 4-volt scale gave greater accurary than the 40-volt. The former had 10,000 ohms resistance and the latter 100,000 ohms.

Telephone News

United States Long-Distance Company Rounding Up Ohio Contract Breakers

Encouraged by the results of the litigation against the Delphos Home Telephone Company, the United States Telephone Company has instituted suits against the Wapakoneta Telephone Company, of Wapakoneta, Ohio, and the Spencerville Telephone Company, Spencerville, Ohio, to enjoin them from turning over their toll business to the Bell companies. It is stated that the contracts between the United States Telephone Company and these two companies are the same as the one made with the Delphos Home Telephone Company. With the decision of Judge Quail, making the temporary restraining order against the latter-named company permanent, the United States is in a good position to fight, and it is probable that suits against other companies will be brought soon.

Meeting of Northern Kansas Independent Telephone Association

Members of the Northern Kansas Independent Telephone Association came together for their eighth annual meeting on July 21 at Clay Center, Kan. A program had been carefully prepared some time in advance, and topics of primary interest in this territory were carefully discussed.

President C. L. Brown, of Abilene, gave a review of the past year's experience. The subjects scheduled for discussion were taken up thoroughly, each topic being opened with a paper, or carefully prepared talk, after which the members joined in freely. Among the subjects considered were the following: "Mutual Telephone Companies and Their Effect Upon Stock Companies," "Protection of Regularly Established Telephone Companies Against Invasion of Territory and Unfair Competition by City Governments," "The Attitude of a Telephone Company Toward the Public," "Do Our Flat Rates Pay?" "Are Our Long Distance Lines Equal to the Demand for Service?"

This organization has been making good progress, and the members work together with good results. Only one grievance was brought up at the meeting, and it is expected that this will soon be adjusted by the arbitration committee, to which it was referred. The organization of the association has been financed upon a basis of an admission fee of 1 cent for each mile of toll line and 1 cent for each telephone in the exchange of the applicant. Dues are levied annually on the same scale. Meetings are held semi-annually, in January and June. The next meeting is to be held in January between the 15th and 25th, the exact date to be announced later by the executive committee.

Officers of this association are: C. L. Brown, president; H. L. Pierce, vice-president; W. W. Dilworth, treasurer, and Dr. D. C. Tyler, secretary. The executive committee is composed of W. H. Nelson, A. T. Rodgers, F. W. Dougherty, J. C. Gurnea and T. M. Dolan.

Obstacles to New Franchise for Indianapolis Independent Companies Believed to Have Been Cleared Away

Public talk and newspaper arguments relating to the consolidation of the Indianapolis Telephone Company with the Central Union system have very nearly ceased, says our Indianapolis correspondent, and at the present time it seems to be the opinion in a great many quarters that such consolidation would not only be impractical, but illegal. The recent attempt by the prosecuting attorney, which is alleged, on what is considered to be strong evidence, to have been backed by the Central Union Telephone Company, to enjoin the Indianapolis and New Telephone Company from accepting the proposed new franchise has failed. This was taken from the Marion County courts, where Judge Allen granted a change of venue, and Judge Clark, before whom the case was carried, has not granted the injunction so urgently demanded.

There has been no disposition on the part of the Council to hurry the ratification of the franchise, and this disproves the plea of the prosecutor that unless a restraining order was immediately issued the franchise would be ratified in unseemly haste. It is reported that, in all probability, the franchise will be ratified at the next Council meeting. In the meantime the Indianapolis Telephone Company is understood to be making preparations to go ahead with the installation of large quantities of new equipment, which are needed to bring its plant up to the requirements of the demand for its service.

Independent Company at Council Bluffs Raises Two-Party Business Service Rates

The Independent Telephone Company, at Council Bluffs, Iowa, has recently raised its rates for two-party business service from $2 to $2.50 per month. Mr. C. A. Laubach, the manager of the company, made a statement to the public relating that with its present number of subscribers the company would be permitted under its franchise to charge $2.75 per month for two-party busi-

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ness and $3.75 for direct-line business telephones. The $2 rate, it is found, does not afford proper compensation to the company and has accordingly been raised.

In discussing the reasons for the change, Mr. Laubach said:

"Many two-party business lines are used fully as much as single business lines, and cost as much to operate and maintain. We do not put two business houses in the same line of business on the same line, nor do we put a business house and a residence on the same line. The result is that many two-party lines are really single party lines because the circumstances are such that we cannot get two parties on the line. A large percentage of the so-called two-party lines in the business district actually have each but one subscriber who has the sole use of the line. These are among the principal reasons for the advance in the rate on this class of service.

"The tendency among business houses is strongly to the use of single party lines. Many business houses have two separate single party lines.

"The demand in residence telephones tends to party lines, either two-party or four-party. The rates on these are unchanged. For four-party service the company has always been empowered to charge $1.25 per month, but has never charged more than $1, and no increase in the rate is likely for an indefinite period in the future."

The business of this company has increased rapidly since the installation of its exchange. Its service is now so valuable that there is no prospect of serious objection to the increase in rates.

Decision in Favor of Validity of Delphos 99-Year Contract with United States Long Distance

A notable victory was won in Common Pleas Court at Lima, Ohio, by the United States Telephone Company on July 28 when the court refused to dissolve the restraining order issued last April to prevent the Delphos Home Telephone Co., of Delphos, Ohio, from interchanging business with or sending its long distance business over the lines of the Central Union Telephone Company. In 1899 the Delphos company entered into a 99-year contract with the United States Telephone Company, which has its headquarters at Cleveland, Ohio, for handling the long distance business. This contract contained an exclusive feature which prevented the local company from connecting with any other company for long distance business, although it did not interfere with its connection with other local companies' lines.

A year ago last March the Delphos company entered into an agreement with the Central Union company (Bell), allowed it to put its wires on the long distance board, the same as the United States had done, and endeavored to divide the business. Last March suit was brought for an injunction to prevent the company from giving the Central Union any of its business, and a temporary restraining order was granted. In April the attorneys for the Central Union filed a motion to dissolve the order, and it was upon this motion that the hearing was had.

Briefs had already been filed by both sides and the hearing was very elaborate, the taking of evidence consuming about three days. The records are so complete that they will probably be used if an appeal is taken to the higher courts.

The grounds on which the defendants claimed that this contract should be set aside were that it is void and contrary to public policy because it tends to create a monopoly and also prohibits the Delphos company from discharging the obligations which it owes the public. The contention was also made that the contract was invalid and could not be enforced because of lack of mutuality, and because enforcing it would involve continued supervision by the court of the operation of the telephone exchange and fixing of the telephones rates for 99 years, and because the contract was oppressive, unreasonable and unjust.

Judge Quail, in his opinion, disposed of each of these contentions. Regarding the discharge of obligations to the public, he said that the Delphos company under its charter was not organized for the purpose of furnishing long distance service and, therefore, is not in duty bound to furnish such service. He traced the history of the situation, from the time the Delphos company made vain attempts to secure, at a reasonable rate, connections with the toll lines of the Central Union company through the building of Independent toll lines, as a result of the investment for which the 99-year contract served as a guarantee.

Judge Quail stated that the terms of the contract seem to be fair and reasonable. He struck a hard blow at the proposition to operate lines of the two competing companies from the same board in the following words: "It is a known principle of law that no individual can act as the agent for two competing parties, and it would be very easy for the agent to discriminate for or against either the plaintiff or the Central Union company, and it shows the wedge which might destroy and render valueless to a large extent the property rights of the plaintiff company, which are built up and based upon contracts similar to the one set forth as the basis of the action in the plaintiff's petition."

As to the contention of the defendant company that the continuance of the contract would tend to create a monopoly, he said that the people of Delphos have had an opportunity to use the long distance lines of the Central Union company, which were brought into the city and terminated in booth telephones.

The decision is very important from the fact that this is one of the original contracts made by the United States company, and about 220 others in Ohio are patterned after it, as well as several in other States. Should this be carried to the higher courts and won by the Independent long distance company it will establish the company's right to hold all the local companies to their contracts in allowing no other company to have any part of the long distance business. Several other instances have occurred where an attempt has been made to have the service of both the companies for long distance business.

Cable & Parmenter, of Lima, were the attorneys for the United States Telephone Company, while it is stated that John W. Warrington, of Cincinnati; D. K. Tone, of Chicago; Judge John M. Linderman, of Lima, and W. D. Mann, the Central Union company's attorney at Indianapolis, represented the Bell interests.

Public Service Corporation Bonds Compared with Those of Municipalities

In a recently issued pamphlet the Theodore Gary Investment Company, of Macon, Mo., has set forth in parallel columns the principal features appealing to the investor which apply respectively to the bonds of municipalities and those of public service corporations.

Points of close similarity between the two classes of securities are evident with respect to the features of organization of the responsible body, authority for bond issue, and the process of issue. While municipal bonds must be registered with the state auditor, the registered bonds of public service corporations based on a sound property furnish as good protection to the investor, since the trustee by whom they are registered, which is usually some trust company or other large corporation having the necessary power, certifies on each bond that it is issued in compliance with the terms of the mortgage on the company's property. The security for high-grade public service corporation bonds is likely to be rather better than in the case of those of municipalities, as the latter have comparatively little tangible property, and can only pledge as security their power to produce revenue from taxation. Public service corporations, on the other hand, usually possess property valued in excess of the bond issue. While the public service corporation thus furnishes a security which is unavailable to a municipality, its revenue producing power is just as firmly based as the latter's tax system. This statement is warranted by the recognized indispensability to a large section of the population of the service which such a corporation furnishes. Its income proceeds usually from a number of citizens considerably greater than the total number of taxpayers in a city.

In management also the public service corporation has an advantage, inasmuch as the average municipality is obliged to

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permit its business to be conducted by men who at the same time are carrying on other business. A public service corporation is usually managed by an expert, who gives his entire time, training and ability to its affairs, so that it continually gets the best returns from a given expenditure, made with closer judgment, and perhaps higher regard for the future, than is commonly employed by city officials.

When the points of similarity in fundamental features, with the advantages mentioned, together with the additional all-important feature of higher income are borne in mind, the conclusion at the end of this circular, "that it lies with the investor whether he is willing to take 4 per cent or nearer 6 per cent; he is equally sure of his interest on one side as on the other," seems to sum up the case.

Book Review.

TELEPHONE LAW. By A. H. McMillan. McGraw Publishing Company. 320 pages. Price, $3.

During his four years' connection with the AMERICAN TELEPHONE JOURNAL, as legal editor, Mr. McMillan has not only kept in close touch with the progress of the application of the law to cases affecting telephone companies, but has been able to acquire an exceptionally broad and clear understanding of what practical telephone men need to know about legal matters. The result is that his book gives just the information needed by busy men in the field, without perplexing discussions, and in language so free from technicalities that there can be no mistaking its meaning.

The organization, incorporation and preparation of working plans for telephone companies are covered, and such questions as franchise limitations and state and municipal regulation of rates are treated in the first chapters of the book. Other divisions give the law on rights of way, eminent domain, location of poles and wires, respective rights of telephone and electric light and traction companies, joint occupation of pole leads, subway rights and tree trimming.

Among subjects more immediately affecting business management are discussions of the law in relation to telephone companies as common carriers, financing plans, contracts, fire and employer's liability insurance, house moving and questions of damages. An appendix gives standard forms for the principal papers used by operating telephone companies.

The book furnishes as complete a manual of the law as is necessary to enable managers, construction foremen and others to keep out of difficulties, and the citations will also be found a valuable guide to local attorneys.

Florida State Telephone Association Meeting at Ocala

The Florida State Telephone Association held a convention at Ocala, Fla., on July 23. This was the first regular meeting held since the organization of the telephone men of Florida and was largely attended by managers from all over the State and representatives of various firms manufacturing telephone supplies.

The convention was called to order by President W. G. Brorein, of Tampa, who introduced Judge W. S. Bullock. Judge Bullock made a speech welcoming the members, and Dr. P. W. Butler responded on behalf of the association. Papers were presented by Mr. E. E. Voyle, of Gainesville, on "Toll Lines;" Mr. W. U. Lathrop, Bradentown, on "Directories;" Mr. E. Scott, Arcadia, "On Subscribers and Collections;" President Brorein on "Rates and How to Raise Them." The discussions of the various papers were participated in by the following: Mr. W. U. Lathrop, Mr. W. G. Brorein, Mr. A. H. Grant, Mr. J. A. Helvin, Mr. G. H. Fernald and Mr. P. W. Butler.

In the evening a banquet was held at the Ocala House.

At the concluding session held in the morning of July 24, a constitution was adopted and the following officers re-elected: President, W. G. Brorein, Tampa; vice-president, E. E. Voyle, Gainesville; secretary-treasurer, George R. McKean, Ocala.

The following were present at the meeting: W. G. Brorein, Peninsular Telephone Company, Tampa, Fla.; W. U. Lathrop, Peninsular Telephone Company, Bradentown; E. E. Voyle, East Florida Telephone Company, Gainesville; C. C. Voyle, East Florida Telephone Company, Gainesville; J. C. Griffin, Pasco County Telephone Company, Dade City; Frank Sands, Palatka Telephone Company, Palatka; J. B. Steinmitz, Apopka Telephone Company, Wekiwa Springs; George H. Fernald, Sanford Telephone Company, Sanford; W. B. Merck, Eustis Telephone Company, Eustis; W. H. Reynolds, Orlando Telephone Exchange, Orlando; O. B. Dees, Mayo Telephone Exchange, Mayo; P. W. Butler, Leesburg Telephone Company, Leesburg; J. C. Howell, Anthony; J. B. Curtis, Orange Heights; Ed. Scott, Arcadia Telephone Company, Arcadia; H. L. Lee, George R. McKean, Ocala Telephone Company, Ocala; H. R. Frazee, West Coast Telephone Company, St. Petersburg; E. C. Stenstrum, Wauchula Telephone Company, Wauchula; O. A. Lyon, Live Oak Telephone Company, Live Oak. The salesmen present were: J. A. Helvin, of Charlotte, N. C., representing the Stromberg-Carlson Telephone Manufacturing Company; H. A. Grant, of the Florida Electric Company, Jacksonville, Fla.; H. P. Dixon, of Atlanta, representing the L. M. Ericsson Telephone Manufacturing Company; A. L. Shaw, of the Sumter Telephone Manufacturing Company, Sumter, S. C.

Methods of W. F. Little & Co. Under Investigation

In our issue of June 13 was published a notice from the International Independent Telephone Association stating that the methods of W. F. Little & Company, of St. Louis, were under investigation by the Post Office authorities and by the association. The association now has in its possession copies of a number of interesting letters setting forth the opinions of the writers, based upon actual dealings with this firm, the originals being on file with the Post Office authorities.

The association invites interested parties to correspond with it and will cheerfully furnish such information as it has upon receipt of a request.

Twenty-Five Per Cent Increase in South Dakota Telephone Assessments

The increase in the number of telephone lines in South Dakota for the past year probably will bring the assessed valuation of such lines to nearly $1,000,000 this year. Last year they footed up $851,694, and since that time hundreds of miles of new line have been constructed. This class of property has reached such proportions in South Dakota that the assessment of it takes up a great deal of the time of the State assessment board. While a large number of companies have made the required report of their mileage of lines and wires and other data, many at this writing have not done so. In the cases of companies which have defaulted in this respect on July 27, the last Monday in the month, the State board is authorized by law to increase their assessment 75 per cent as a penalty, as delay in the receipt of the reports delays the work of the board.

South Bend Home Gets Important Hotel Branch Exchange Contract

The Mishawaka Public Improvement Company has awarded a contract for the installation of a private branch exchange telephone system to the Home Telephone Company in the new and modern hotel it is constructing in Mishawaka. A modern switchboard with a capacity of 100 or more telephones and trunks to the Home company's Mishawaka exchange will be installed. Four trunk lines will be run from the hotel to the exchange to take care of the outside business, and the most modern equipment available will be used in installing the plant.

The splendid local service in South Bend and Mishawaka, as well as the extensive toll business the company has, is what prompted the owners to award the contract to the Home company, notwithstanding the bid of the Central Union company is

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said to have been much lower. President Theodore Thorward says a number of local concerns are considering the advisability of installing similar plants, and bids have been furnished by the Home company for the work.

Prospect of Litigation on U. S. Independent's New York City Franchise

It is reported from Rochester, N. Y., that preparations are being made to serve papers in a mandamus action upon officers of the City of New York to compel them to recognize the rights of the U. S. Independent Company to operate under a franchise which it asserts is valid.

The reorganization committee has recently issued to participants in the reorganization plan a statement of the receipts and expenditures of the committee, and recommends testing the validity of this franchise in the courts.

Operating Organization of the New England Telephone & Telegraph Company

The accompanying diagram indicates the operating organization of the New England Telephone & Telegraph Company which went into effect on Aug. 1. Final authority is centered in the general manager, heads of the traffic, engineering, plant and commercial departments reporting directly to him. The engineering department is subdivided into sections whose respective duties relate to plant engineering, equipment and buildings, construction, records and office force. As stated in our issue of Aug. 1 the duties of this department are mainly advisory to the general manager.

In the traffic department, the traffic engineer and his assistants report to the general superintendent of traffic in an advisory capacity. Four division superintendents of traffic are included in the organization, and under these are district traffic chiefs. In the Boston and Southern Massachusetts division the organization includes the pay station manager, supervisor of traffic and the operators' school.

The plant department has four division superintendents, and reporting to these are district plant chiefs, construction engineers, equipment foremen, special agents and clerks.

The commercial department has, like the other branches of the organization, a general superintendent, with four division superintendents of commercial work. Reporting to the latter are district managers, clerks and special agents, as indicated on the diagram.

American Union Starts $50,000 Improvements at Clearfield, Pa.

The American Union Telephone Company, of Harrisburg, Pa., last week purchased from Frank G. Harris, ex-State treasurer of Pennsylvania, a three-story brick building at Clearfield, Pa., as a home for the new exchange which this company will install there. The company contemplates the immediate expenditure of $50,000 at Clearfield as a part of its general improvement scheme. This will include building a new line from Clearfield to Du Bois.

Pioneer Company Restrained from Raising Rates in Guthrie

On July 23 County Attorney Hepburn filed with the Oklahoma Corporation Commission a protest against any raise of rates in Guthrie by the Pioneer Telephone & Telegraph Company. It is probable that a hearing will have to be held to pass upon the question, although the question of telephone rates in Oklahoma has recently been exhaustively discussed in public.

Fire Alarms to Be Turned in from Frontier Telephones in Buffalo

An arrangement has just been made with the Fire Commissioners of Buffalo, N. Y., whereby a subscriber of the Frontier Telephone Company (Independent) on lifting the telephone from the hook and saying "Fire" will at once receive connection with a special line to the fire department. Alarms may be turned in from pay stations without cost

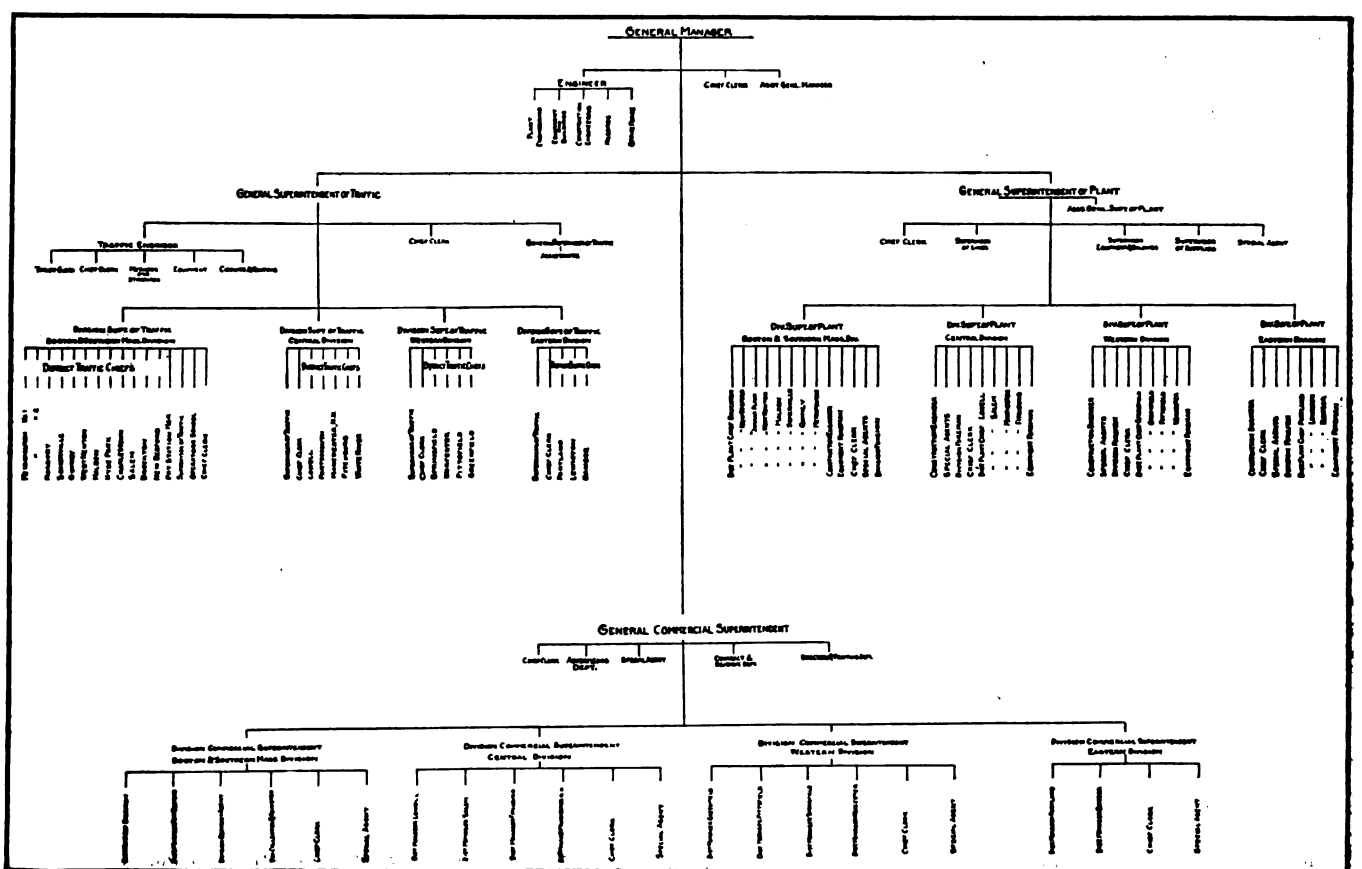

Chart Showing Operating Organization of the New England Telephone & Telegraph Company.

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Reviews of Foreign Technical Articles

Inductive Effects of High-Tension Transmission Lines on Telephone Wires.—O. BRAUNS.—A paper communicated from the German Imperial Telephone Experiment Station and read before the Berlin Electrical Society. On some parts of the 34,000-volt, three-phase transmission system in the Urft Valley district, telephone lines are run within the neighborhood of the transmission line and serious disturbances due to induction of electrostatic charges have been experienced. On one telephone line which had formerly a ground return, the disturbances disappeared after the line had been equipped with a full metallic circuit. But on branch connections of this line, which are equipped with a single grounded conductor, the disturbances remain; they were due to electrostatic charges induced from the two-conductor main telephone line. By providing a proper earth connection for the latter, the troubles in the branch connections were removed. In this connection extended experiments were made by the Telephone Department. It was found that while electromagnetic induction from the transmission line appeared to have comparatively little effect on the telephone line, measurable electrostatic charges were induced from the former on the latter, even if the distance between the two was as much as 800 yd. On the basis of the experimental research, formulas have been worked out which enable one to predetermine the electrostatic effect with an accuracy sufficient for practice. If the currents produced by this effect in the telephone line are of the order of magnitude of 10^{-5} amp, the telephone line must be equipped with a full metallic circuit. This removes the difficulties in sound transmission in this line itself, but the electrostatic charges are not thereby removed.

Hence, if the line has single conductor branch connections troubles will be experienced in the latter. They are to be expected if the induced voltage in the main telephone line is above 5 volts. In such cases it is necessary to provide the main telephone line with suitable ground connections.

Besides the troubles in transmission of speech there may also be danger to persons touching the telephone wire. Under normal conditions there is no danger, but in the case of an accidental ground on the high-tension power transmission line, the voltage induced in the telephone line may be increased thirteenfold. The author sets up the requirement that under normal conditions a person touching the telephone line should not be subjected to a voltage of more than 10 volts. It is shown that if a two-conductor telephone line runs for a length of 30 km (19 miles) at the side of a 40,000-volt power transmission line at a distance of 15 m (about 50 ft.), a person with an internal resistance of 2000 ohms will be subject to a voltage of 12.2 volts when touching the telephone wire under normal conditions. But this will be increased to about 160 volts in case of accidental ground on the power transmission line. To prevent such accidents proper grounding of the telephone line is necessary. The same issue contains an account of the discussion which followed the reading of the paper.—*Elek. Zeit.*, April 9.

Mechanical Properties of Bronze Wires.—G. NICHOLAUS.—A paper communicated by the German Imperial Telegraph Experiment Station. When telegraph or telephone wires have been placed on poles it is found that after a certain time the sag increases and there may be danger of two wires touching each other. This is partly due to the gradual straightening out of bends, etc., and partly due to the fact that the elastic properties of the wire change. To avoid this it has been tried to subject the wire to a preliminary stretching treatment before placing it on the poles. Figures are given, together with diagrams, on the behavior of bronze wires in comparison with iron wires, and it is shown that if a bronze wire shall show perfect elasticity up to a certain tension there are two possible means of preventing after-sagging. Either the wire is subjected to repeated stretching to a desired maximum tension or it is subjected to a single stretching operation beyond the desired maximum tension. It is shown that the latter way is unsuitable for practice. In practice the maximum is chosen at about two-thirds of the elastic limit and a satisfactory preliminary treatment consists in stretching the wire twice slowly up to this maximum tension, which is kept constant for about two or three minutes. Practice has shown that bronze wires treated in this way do not increase their sag in time, while the changes in mechanical and electrical properties of the wire due to this treatment are practically insignificant. It is necessary to subject the wires to the preliminary treatment just before they are placed on the poles, since wires which have been treated that way and are left then without tension for a long time slowly assume again their former properties.—*Elek. Zeit.*, March 26.

Telephone Experiments.—HEILBRUN.—An illustrated description of a lecture-room apparatus for demonstrating the physical laws of telephony. The horn of a phonograph of simplest construction is removed and replaced by an elastic band while the pin which slides along the revolving record is fixed to the diaphragm of a transmitter. The transmitter, the source of current, the lecture-room galvanometer and a loud-speaking telephone are connected in series. If now the phonograph is started it does not send direct sound waves into the lecture room, but through the intermediary of the telephone. The sounds produced are said to be much superior to that of ordinary talking machines. With this arrangement it is possible to demonstrate quite a number of telephone laws; for instance, the influence of different frequencies, the relative advantage of different systems of connections, etc. The galvanometer needle is seen to make regular oscillations. Of course, it does not reproduce the minute current oscillations of the transmitter. The oscillations of the galvanometer needle are due to the fact that the mean value of the transmitter resistance is considerably greater during the speaking period than when the diaphragm is at rest.

This is most noticeable during whistling. It is, therefore, incorrect to state, as is usually done, that the resistance of the microphone during speaking oscillates around the resistance at rest. It really oscillates around another average resistance.—*Elek. Zeit.*, March 26.

Manufacture of Magnet Coils.—F. SCHNAUBERT.—An illustrated description of the equipment of a large factory for electromagnet coils for telegraphy and telephony. For testing purposes a bridge is recommended which does not measure ohms, but the percentage deviation from a standard coil. The construction of the bridge and of the galvanoscope which belongs to it are described.—*Elek. Zeit.*, April 9.

Free Telephones at Richmond, Ind., Introduce Complications

It is reported that the Central Union Telephone Company is meeting with unexpected opposition in efforts to discontinue certain local service in Richmond, Ind. It seems to be the local belief that the Central Union is attempting to get rid of a certain number of its local subscribers by increasing the rates, thinking this will drive them to use the telephones of the Home company's plant. This plan worked out as expected with a majority, but a few of the subscribers claim to have a contract calling for service free or at a given rate until 700 subscribers shall be obtained. As this number has not been secured, it is claimed by these subscribers that the company cannot cancel its contracts and that they will insist on its furnishing service as was agreed.

Belgian Telephone Statistics

Figures on telephone development, traffic and revenue for Belgium during the year 1906 have just been published in the *Journal Telegraphique*. The system of telephone lines increased from 136,218 km of wire in 1905 to 154,477 in 1906, an addition of 18,259 km. There were 182 exchanges, an increase of 20 over the previous year, while the number of subscribers increased to 26,071, being in excess of the number of 1905 by 2779. The system handled 2,969,619 internal conversations, while 281,896 conversations took place with foreign countries. There were exchanged with Germany 64,404 conversations; with England, 12,301; with France, 154,488; with Holland, 46,709; with Luxemburg, 3994.

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Receipts on account of the inland service totalled $207,308, an increase over 1905 of $22,587, while the receipts on account of the international service were $112,021, an increase over 1905 of $13,444. The total receipts from exchanges and toll lines amounted to $1,548,003, an increase over 1905 of $168,893.

Public Rejoicing Over New Independent System Near Muncie, Ind.

The residents of Gaston, Ind., celebrated the establishment of the Gaston Home Telephone Company by a public parade in which nearly every person in the community participated. A band played, fireworks were shot off and speeches were made.

A few months ago patrons of the Central Union Company (Bell) in Gaston and its vicinity ordered the company to remove its telephones because a toll was charged on every message to Muncie, a few miles distant, in violation of an express agreement which had been previously made that free service with Muncie was to be had. The company made no move to remove its telephones, and the subscribers tore them out, organized a local company, put in new instruments and are now connected with Muncie over the Delaware & Madison Counties telephone system.

Telephone Protection for Alpine Tourists

Recent dispatches from Switzerland state that various Alpine shelters are to be connected with neighboring towns by telephone for the benefit of tourists obliged to take refuge therein. These would seem to indicate that, as was to be expected, experimental installations made some time ago have proved their value, and the plan is to be generally adopted in regions of danger to climbers.

Chicago Telephone Company Opens New Exchange

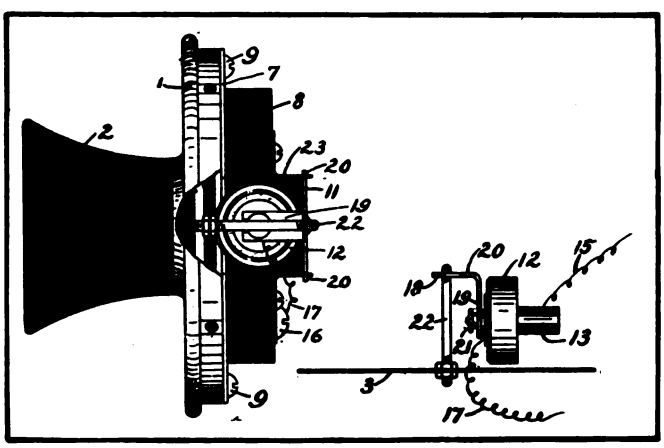
The Chicago Telephone Company recently opened a new exchange in the downtown district which will have an ultimate capacity of 10,000 subscribers. The new office which will be known as the "Franklin" office has been opened to relieve congestion, and take care of future growth in the "Main" district.

Telephone Patents

TRANSMITTER.

Emile J. Pitrat, Urbana, Ill., patent 894,460, July 28, 1908.

This invention covers a granular carbon transmitter in which the button is kept in a vertical plane regardless of the position of the body or mouthpiece of the transmitter. The effect of



vibrations of the diaphragm receiving the impact of sound waves is simplified by a system of levers limited to the movable electrode.

The button is mounted at right angles to the speaking diaphragm, as shown in the illustration, and then the transmitter as a whole is mounted on its support so that the button is held in a vertical position. The button 12 is mounted at right angles to the diaphragm 3, as shown, so as to be always in a vertical plane. A lever having arms 18 and 19, at right angles to each other, is pivoted at 20, 20 on the brackets 23, 23, which are mounted on the insulating block 8. The long arm 19 is connected to the front electrode of the button, and the short arm 18 is connected to the diaphragm 3 by a rod 22. By this arrangement of the arms the vibrations of the diaphragm 3 are amplified before acting on the front electrode of the button. This is claimed to make a very sensitive and powerful transmitter.

TELEPHONE APPARATUS.

Arthur M. Cobb, Lynn, Mass., patents 894,257 and 894,258, July 28, 1908.

These patents cover apparatus for securing a transmitter and receiver to the head, so that they may be maintained in proper relation to the ears and mouth, regardless of the movements of the body and head of the user. The apparatus is designed to be used on war vessels in giving orders to the gun captain.

Receivers are held to the ears by means of bands extending across the top of the head, around the back of the head and beneath the chin. Another band, having its ends fastened to the receivers, extends in front of the face and supports the transmitter. It can be adjusted vertically and horizontally.

In the Manufacturing Field

The Cracraft, Leich Transmitter

Transmitter construction presents problems of interest not only to the manufacturer, but also to the exchange manager. Commercial success for any transmitter depends not only upon the talking qualities at the time of purchase, but upon durability, secured through the use of appropriate materials worked up into forms which will maintain permanent relations with one another. The value of a transmitter depends to a large extent upon the quality of the granular carbon used, and the selection and preparation of this material is a constant source of care to manufacturers. Polished carbon electrodes, too, have been the subject of much careful experiment and thought. The most valuable property which they possess is that of permitting interruptions of the circuit between a section of the electrode and an adjacent contact to be made without causing destructive sparking. The use of materials not possessing this property is believed under certain conditions to result in arcing, manifested at the other end of the line in a sound known as "frying," which corresponds to a practically useless condition of the transmitter for talking purposes. There is apparently a certain quality in articulation secured between contact surfaces of polished carbon and granular carbon which is not experienced with other materials.

Engineers of the Cracraft, Leich Electric Company, Genoa, Ill,. who have been interested in the development of transmitters

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and transmitter carbon for a number of years, have profited by their experience and produced for that company's transmitter carbon electrodes and granular carbon of a special grade in respect to hardness and durability.

In mechanical features, this transmitter presents several interesting points. The bridge is of pressed steel, all other parts being of brass. The position of damping springs is especially worthy of note. They bear directly upon the center of the diaphragm. To insulate them, mica washers are inserted, giving

The Cracraft, Leich Transmitter.

a great damping effort. The absence of felt or rubber upon the tips of these springs, which are of German silver, is another interesting feature intended to increase the range of vibration, with the object of producing greater sensitiveness in the transmitter.

Another point which has been considered in the construction of this instrument is the elimination of natural vibration tending to influence the form of electrical waves sent out from the transmitter. It is well known that almost any material under stress, or clamped in position, will respond to certain vibrations more readily than to others, proving that the article is tuned to that particular pitch to which it responds most readily.

As the secondary diaphragm of a transmitter is rigidly clamped it necessarily follows that it must be tuned to vibrate with a certain natural periodicity. The engineers who designed this instrument announce that the mica diaphragm of the Cracraft, Leich transmitter is proportioned in such a way that it will respond most readily to vibrations that are somewhere near the average pitch of the human voice, with the object of giving it a maximum efficiency for commercial service.

All parts of this transmitter are thoroughly insulated from the frame, and the terminals can be reached from the side of the shell, which is a convenience appreciated by troublemen.

All Steel Lockers

Telephone companies use a great many lockers, especially those companies which employ a large operating force. Most of the telephone companies have adopted metal lockers on account of their fireproofing qualities and cleanliness.

A steel locker which is extensively used is that manufactured by the General Fireproofing Company, of Youngstown, Ohio. These lockers are of various styles, ranging from the expanded metal locker for the workshop, to the all sheet steel wardrobe with a dust excluding hooded ventilator. The lockers are finished with a hard enamel baked on at a high temperature so that it is not easily marred.

In addition to the all steel lockers the company manufactures a complete line of all metal office furniture and filing devices. This furniture is finished to so closely resemble quartered-oak or mahogany, that it is said to be impossible to detect the difference by sight alone. The advantages this kind of furniture possesses over wood are being recognized by many companies.

Ericsson Company Reports Orders for Good-Sized Equipments

The L. M. Ericsson Telephone Manufacturing Company, of Buffalo, N. Y., has recently closed contracts for new switchboard equipment with the Citizens' Telephone Company, of Columbia, Tenn., and the Pawnee City Telephone Company, of Pawnee City, Neb.

The contract with the Citizens' Telephone Company calls for four sections of Ericsson type B switchboard, main distributing frame and power apparatus. The first two positions of the board will be equipped for series lines, using the well-known Ericsson "indicator jack." The last two sections will be arranged for farmers' lines and toll lines, and will be equipped with the new Ericsson No. 5 mechanically restoring tubular drop.

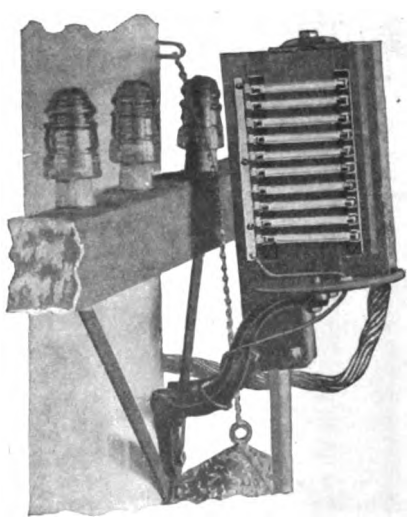
This drop combines with the mechanically self-restoring device, the extreme sensitiveness and features of accurate adjustment which render all Ericsson drops so reliable. Transfer wires and order keys will also be provided for making connections between the various positions.

The Pawnee City contract calls for a complete common battery central office equipment. The Pawnee City Telephone Company has recently built a new fireproof building designed especially for a central office, and when completed the plant will be a model one. The equipment will consist of two sections of common battery board, a toll board, wire chief's desk and complete power plant.

A New Bissell Terminal

A new can top terminal which has just been placed on the market by the F. Bissell Company, Toledo, Ohio, has been designed to secure to the greatest possible degree the essential qualifications of simplicity, compactness of arrangement and low maintenance cost. The insulation used in this terminal is stated to be all rubber and connections are made through heavy machine screws with hexagon nuts for both spider wire and pot head connections. Spring contacts hold in place the well-known "Security" enclosed high-tension fuses, which are renewable at low cost. These spring contacts are so designed as to provide a large area of contact surface.

The can top is furnished with or without pothead and with carbon or Western Union lightning arresters, as may be desired. The Bissell Company reports that lately the demand for Western Union arresters is increasing, as many of its cus-



The New Bissell Pole Terminal.

tomers seem to hold the opinion that they will furnish the necessary protection and eliminate many of the troubles due to grounding of the line through carbon dust.

Matthews' Construction Book a World Traveler

The accompanying illustration shows an acknowledgment for one of the telephone line construction books issued by W. N. Matthews & Bro., of St. Louis, Mo., which is a "regular old tar," as it has crossed the equator twice. Mr. A. B. Powers,

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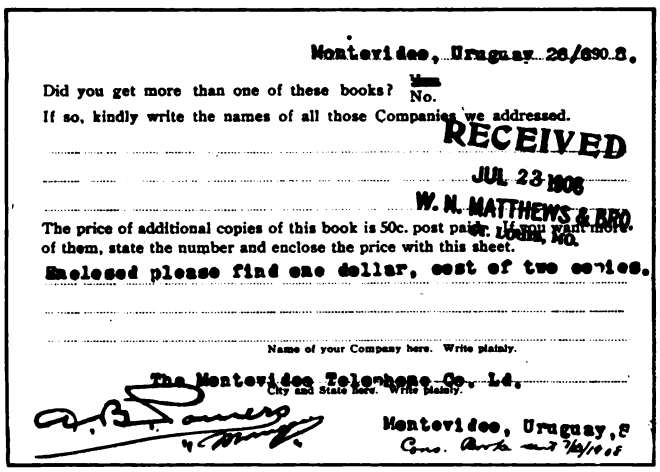
general manager of the Compañia Telefonica de Montevideo, Uruguay, South America, is an able and alert telephone man who is constantly seeking information concerning the best methods in telephone construction throughout the world. The book issued by W. N. Matthews & Bro. was sent him with the



Montevideo, Uruguay 26/6/08.

Did you get more than one of these books? Yes No.

If so, kindly write the names of all those Companies we addressed.

RECEIVED JUL 23 1908 W. N. MATTHEWS & BRO. ST. LOUIS, MO.

The price of additional copies of this book is 50c. post paid. If you want more of them, state the number and enclose the price with this sheet.

Enclosed please find one dollar, cost of two copies.

Name of your Company here. Write plainly.

The Montevideo Telephone Co., Ld.

City and State here. Write plainly.

Montevideo, Uruguay, S. Amer.

Acknowledgement Received from Uruguay, South America.

compliments of the publisher, and apparently proved so interesting that he attached to his acknowledgment slip a good American dollar bill, which he may have kept handy for an emergency since his last visit to the United States.

This book on construction work gives detailed descriptions of some of the most interesting uses of the well-known Matthews cable splicing joint, formerly known as the Hargis joint. These are now meeting with a favorable reception in many foreign countries, as well as all over the United States. During the past year orders have been received from Australia, Porto Rico, Mexico, England, Cuba and Tasmania, as well as from all parts of Canada.

The Newest Stromberg-Carlson Relay

The Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has recently begun to manufacture a new type of relay, designed especially for use on systems operating on 20-volt battery. Though quite similar in general design to the standard relay of that company, the new relay embodies several features worthy of attention.

The magnetic circuit is composed wholly of the best quality of Norway iron. The new design permits all parts except the core to be punched out instead of milled, thereby considerably lessening the expense of manufacture, it is said, with no sacrifice of efficiency. As in the previous type, the armature is suspended at one end from a pivot piece below the relay coil and at the other by a small bolt extending up through the heel iron. When energized, the armature approaches the heel iron, but metallic contact between the two, with the possible freezing evil, is prevented by a small brass washer slipped over the previously mentioned bolt. The relay is adjusted by varying the position of a locknut on this bolt.

When the relay operates the motion of the armature is transmitted to the German silver springs mounted on a bridge above the relay coil by means of a light brass yoke extending upward from the armature. In order to gain increased sensitiveness on the 20-volt systems the relay springs and also the armature are made somewhat lighter than in the earlier types of relay. The contacts, as usual, are of platinum.

A new feature embodied in this relay is the type of terminal, which consists of a flexible, though substantial brass punching drilled and tinned at the end for the reception of the relay leads, while at the other the relay winding is brought through a hole before being soldered to the terminal, thus precluding any possibility of the wire slipping loose and perhaps becoming crossed with the frame when a soldering iron is applied. With this flexible terminal, breakage of the rubber spool heads from twists or wrenches is not to be feared.

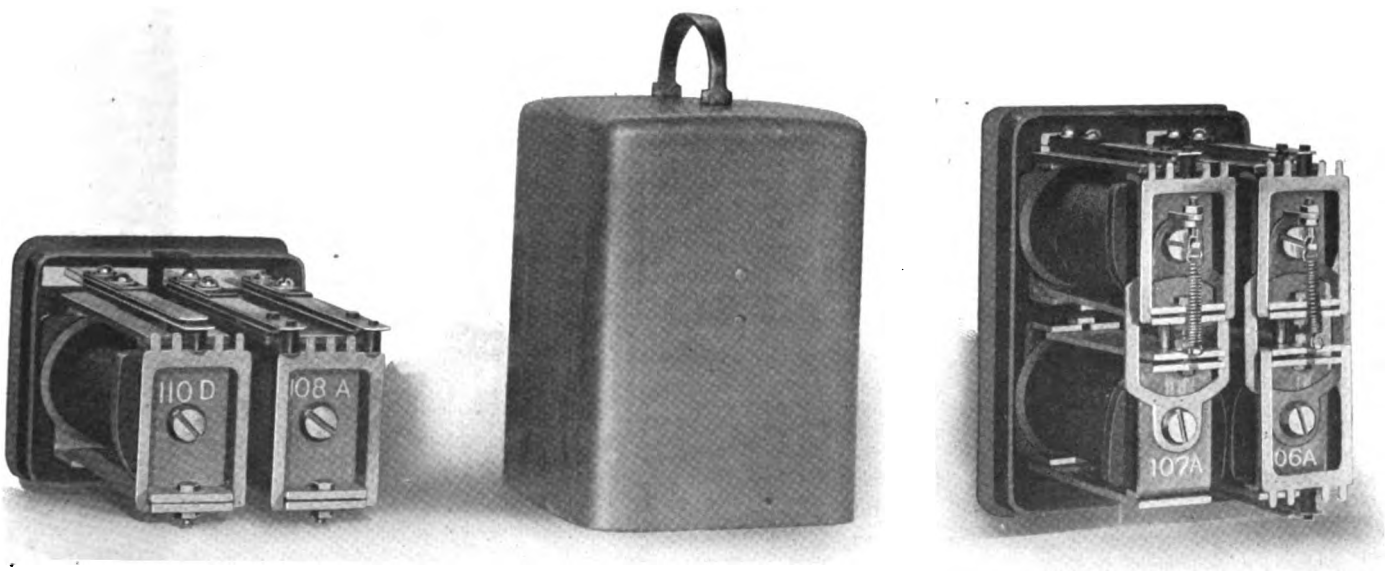
As may be seen from the illustrations, this type of relay is very readily adapted to any combination of contacts which might be desired, the 110-D relay at the left showing the one perhaps most commonly used, making one contact when energized, and employed as a line relay on non-multiple central energy lamp line systems.

The cut to the right shows the new relay as adapted to the standard multiple central energy cord circuit used by the Stromberg-Carlson Telephone Manufacturing Company.

These relays are mounted, as has been the practice of that company, under aluminum relay casings—a casing which besides being a perfect shield against dust and cross-talk, is extremely light and will not corrode.

Owing to the lightness and compact form of this relay it is especially desirable for mounting in switchboard cabinets where room and weight are a factor, and as it is sold at a figure somewhat below the former type, a considerable demand for the new product is expected.

Although designed especially for use on 20-volt systems, it is announced that this new relay may be used with systems operat-



The New Type of Stromberg-Carlson Relay, Especially Designed for Use on 20-Volt Systems.

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ing on a 40-volt battery, though the type of heavier construction is somewhat to be preferred for the higher voltage.

RICHARD WADE & Co., LTD., Garrison Side, Hull, England, have revised their valuable "Catalogue of Wooden Poles." The revised edition contains tables giving information regarding the strength, breaking load, wind pressure, deflection, etc., of poles used in electrical power transmission, telegraph and telephone work, so that the proper size pole required for a given line is easily determined. The tests and experiments from which the tables were compiled were made by Professor Goodman, of Leeds University. The catalogue is illustrated with cuts showing the different tests performed, comparison of treated and untreated poles and the various types of transmission line construction. A pocket edition giving the tables and other information has also been issued. The catalogue is sent free of charge to customers and may be obtained by others for a sum covering the cost of printing and mailing.

THE F. BISSELL COMPANY, Toledo, Ohio, has issued another souvenir advance card. It represents the "Bissell Frog" fishing, and it would seem by the results he is understood to have attained that his bait, good material at moderate prices, is very effective in securing orders.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

NEW COMPANIES

LONG GROVE, IA.—Articles of incorporation have been filed by the Long Grove Telephone Company placing its capitalization at $10,000, and the following officers and directors elected: President, R. K. Brownlie; vice-president, Leonard Lischer; secretary and treasurer, George B. Maxwell; directors, Samuel Barghman, William Reimers, Gustave Helken and James Wyer.

MITCHELLVILLE, IA.—Articles of incorporation have been filed by the Rural & Four City Telephone Company. Its principal headquarters is to be located in Mitchellville, at which place an exchange is to be installed, and lines are to be erected throughout Polk County and in other parts of the state. The company is capitalized at $50,000, and among the incorporators are H. C. Korf, J. H. Little, B. F. Gilbert, A. D. Miller and L. M. Grimes.

BARAGA, MICH.—The Baraga County Telephone Company has been organized, and has taken over the local exchanges in Baraga and L'Anse. Its intention is to build a number of new lines, including toll lines to Skanee and Huron Bay. Among those interested in the new enterprise are Martin Voetsch, county clerk of Baraga County, and A. W. Stark, of L'Anse.

DUBLIN, MICH.—Plans are under way at this place for the organization of an Independent telephone company, whose intention is to install a rural telephone system.

LUDINGTON, MICH.—A new telephone company, to be called the United Telephone Company of Michigan, has been organized at Ludington with a capital stock of $200,000. The new concern is to take over the property of the Lake Shore Telephone Company, now operating in Mason and Oceana counties, and expects to move the general offices from Hart to Ludington, at which place a new exchange building is to be erected. Charles H. Hood, of Detroit, who is among those interested in the enterprise, states that about $78,000 is to be spent in reconstruction and new construction work. The officers of the company are as follows: President, W. A. Cartier, Ludington; vice-president, Gardner Sands, Pentwater; secretary and treasurer, Thomas Bromley, Jr.; attorney, A. E. Keiser. Mr. Bromley, of Hart, is to be the general manager.

NEWFOLDEN, MINN.—At a recent meeting of a number of representative citizens of Ellerth an Independent telephone company was formed, and arrangements made for the construction of a telephone line between that city and Newfolden. The company is to be known as the Newfolden Central Telephone Company, and the following officers have been elected: Ole Hjelle, of West Valley, president; A. S. Rokke, secretary, and H. E. Myhre, treasurer.

ROSEBUD, MONT.—The Rosebud Land & Irrigation Company, which intends, among other things, to install, maintain and operate telephone lines, has filed articles of incorporation. It has an authorized capital stock of $50,000, and among those responsible for its formation are C. W. Atkins and others.

CANAL WINCHESTER, O.—Articles of incorporation have been filed by the Farmers' Independent Telephone Company of Canal Winchester. It has an authorized capital stock of $25,000, and the incorporators are McG. Martens, Thomas J. Barr, Thurman T. Courtright, W. F. O'Gara and B. C. M. Hastings. It is the intention of the company to construct a telephone system connecting Canal Winchester, Columbus and Lancaster, and to eventually extend its lines throughout Fairfield, Pickaway and Franklin counties.

OAK GROVE, ORE.—Among the newly organized companies is the Oak Grove Telephone Company of this city. Its plans include the installation of a local system, and the establishment of connections with Portland and a number of other cities. Its capital stock is given at $4,000, divided into 400 shares at $10 per share, and is said to be almost wholly subscribed. Among those interested in the new enterprise is Judge Dimick of Oregon City.

OKLAHOMA CITY, OKLA.—Articles of incorporation have been filed by the Banner Rural Telephone Company of this city. The capital stock is placed at $2,000, and the following directors have been elected: L. Stichcomb, George L. Myers and J. E. McKinley, of Yukon.

CENTER ROAD STATION, PA.—Plans are well under way for the organization of an Independent telephone company at this city, to be known as the Summit Independent Telephone Company, and whose purpose is to install and operate a telephone system connecting Center Road Station with Penn Line, Steamsburg, Beaver Center, Palmer, Dicksonburg and a number of other places. Those interested in the new enterprise are: Cornelius Brooks, John W. Gaugh, Corry E. Curtis, Merrick Warren and others.

NISBET, PA.—The Independent telephone company at this city, plans for whose formation were discussed some time ago, has completed its organization. It is to be known as the Nisbet Rural Telephone Company, and a charter has been applied for. The company, for whose formation citizens of Nisbet and Susquehanna townships are responsible, has already commenced the construction of a system which is eventually to extend to Bastress and other points.

OLYMPIA, WASH.—From this city comes the announcement of the incorporation of the Rural Telephone Company of Swofford, which expects to install, maintain and operate telephone lines. The capital stock is placed at $10,000, and among the incorporators are: E. D. Overstreet, F. L. Riffe, C. N. Jordon, John O. Doss, J. T. Chilcout, R. L. Hesselman, Charles Hopkinson, John W. Peters and W. A. Davis.

DURAND, WIS.—The Home Telephone Company of Durand has filed articles of incorporation, and contemplates the installation of an up-to-date telephone plant at that city. The new concern is capitalized at $12,000, and among those responsible for its formation are: W. E. Plummer, George Tarrant, A. J. Wallace, Frank Pierce and others.

LUCK, WIS.—The Equity Telephone Company, which is capitalized at $5,000, has filed articles of incorporation, and contemplates the installation and operation of a telephone system in Luck and throughout Polk County. Among the incorporators are: John B. Peterson, E. M. Wilson and J. R. Murphy.

TILBURY, ONT., CAN.—It is stated that an Independent telephone company is being organized at this city with a capital stock of $40,000. Address Dr. Kneister, Comber, Ont., Can.

CANORA, SASK., CAN.—A rural telephone company is being organized by the farmers north of this town. It is to be a mutual system, and work on the construction of the lines is to be commenced at an early date. Address Lewis Simes.

FRANCHISES

BARTONVILLE, ILL.—The efforts of the Central Union (Bell) Telephone Company to secure a franchise at this city have been unavailing, permission to do business in Bartonville having been recently refused them. The Interstate Telephone Company has been granted a franchise, and expects to commence the installation of its plant at once.

CONCORDIA, KAN.—Application for a franchise to do business at this city has been made by the New Hope Telephone Company, which was organized some time ago by the consolidation of several rural companies. While the council has up to the present time refused to grant the company the right to enter the city, it is believed that, owing to the urgent requests for service being made by the business men and citizens of Concordia, this decision will be reconsidered.

DULUTH, MINN.—An amended franchise permitting it to charge toll between Duluth and Superior is being sought by the Zenith Telephone Company, the company stating in its petition that it needs the additional revenue to take care of the proposed extensions in its system.

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Condensed News Reports

OWATONNA, MINN.—The Tri-State Telephone Company is endeavoring to secure a long distance franchise from the Owatonna council. It is stated that the petition has the support of a number of prominent business men of this city.

SOMERSET, OHIO.—A franchise to install and operate a telephone exchange at Somerset having been refused by the City Council to the Citizens' Independent Telephone Company of New Lexington, steps are to be taken at once by that company to secure the necessary grant through the Probate Court, and to have a thoroughly up-to-date exchange installed and in operation by January 1, 1909.

DEADWOOD, ORE.—A franchise has been granted by the county court to the Deadwood & Blachly Telephone Company to construct and operate a telephone system between Deadwood and Blachly.

FINANCIAL

MONMOUTH, ILL.—The capital stock of the Monmouth Telephone Company has been increased from $50,000 to $125,000.

BOTKINS, OHIO.—The capital stock of the Botkins Telephone Company of this city has been increased from $20,000 to $25,000.

KENTON, OHIO.—The Kenton Telephone Company of this city has increased its capital stock from $100,000 to $150,000, in order to take care of the installation of a new system in Kenton. The company now has 1,600 city and rural subscribers.

PROVIDENCE, R. I.—The Providence Telephone (Bell) Company is offering stockholders of record of Sept. 10 the right to subscribe for $500,000 new stock at par ($50) Sept. 18, in the ratio of one share of new stock for each five now held. This will make the total stock issue $3,000,000.

BARABOO, WIS.—The Farmers' Mutual Telephone Company has filed an amendment to its charter increasing its capital stock from $6,000 to $12,000.

HAILEYBURY, ONT., CAN.—At a special meeting of the Temiskaming Telephone Company it was decided to issue $20,000 6 per cent depentures to pay off indebtedness.

CONSTRUCTION

FORT SMITH, ARK.—Arrangements are being made by the Pan Telephone Company for the establishment of a new exchange in this city, and the installation of an up-to-date telephone system.

OAKLAND, CAL.—A new exchange building, which it is estimated will cost in the neighborhood of $32,000, is soon to be erected in this city by the Pacific Telephone & Telegraph (Bell) Company.

LIMON, COL.—The Lincoln Telephone Company, which has its headquarters at Hugo, is installing a telephone system at Limon.

STERLING, COL.—Arrangements are being made by the Colorado Telephone Company for the construction of a toll line from Sterling to Julesburg, which will connect Denver with all the towns in northeastern Colorado.

PLAINVILLE, CONN.—The Southern New England (Bell) Telephone Company is planning for the installation of a new exchange in this city.

CALDWELL, IDAHO.—Work on the construction of its lines at this city has been commenced by the Independent Telephone Company, and arrangements are being made for the erection of a new exchange building at an early date.

CHARLESTON, ILL.—A strictly modern telephone system, which is to cost in the neighborhood of $50,000, is soon to be installed in this city by the Coles County Telephone & Telegraph Company. The plant, it is stated, is to be similar to the one recently put in at Mattoon, and which represented an expenditure of $75,000.

CORNELL, ILL.—A new exchange is to be installed in Cornell at an early date by the Cornell Telephone Company.

PALMER, ILL.—Work is soon to be commenced on the construction of a private telephone line from Palmer to Taylorville for Messrs. Twist Bros., which is to connect with their system at the latter city.

AUBURN, IND.—Arrangements are being made by the Home Telephone Company of this city for the extension of its lines to Corunna and Waterloo, and many other improvements in its plant are planned.

ODON, IND.—In order to take care of its greatly increased business in Epsom and Montgomery, the Odon Telephone Company is considering the advisability of building a number of new lines in these places.

BURLINGTON, IA.—The Mississippi Valley Telephone Company, which has been rebuilding its entire system in Burlington, and which has lately taken possession of its new exchange, contemplates the construction of a number of new lines into the surrounding rural districts.

CEDAR RAPIDS, IA.—The Cedar Rapids & Marion Telephone Company is making many improvements in its plant in this city.

DUBUQUE, IA.—In addition to the overhauling of its system in Dubuque, it is the intention of the Iowa (Bell) Telephone Company to construct a new line to Sageville.

IOWA CITY, IA.—The Rock Island Railroad is considering the advisability of establishing a telephone system for dispatching between the following cities; Chicago and Iowa City, 336 miles of track; Topeka and Harrisburg, 82 miles; Slater and Muscatine, 28 miles.

MANCHESTER, IA.—To take care of new business in this city the Delaware County Telephone Company expects to build additional lines.

OSKALOOSA, IA.—The plant of the Home Telephone Company in this city is to be entirely rebuilt.

WAVERLY, IA.—A new exchange is to be installed in Waverly by the Corn Belt Telephone Company, and its system otherwise improved.

WICHITA, KAN.—Its entire plant in this city is being rebuilt by the Missouri & Kansas (Bell) Telephone Company.

JEFFERSONVILLE, KY.—Preparations are being made by the Independent Telephone Company of this city for the extension of its line from New Washington to Hanover.

LEBANON, KY.—It is the intention of T. M. Estes, who recently secured a franchise in this city, to at once commence the installation of a modern system which will give a strictly first-class service. It is expected that this service will replace that formerly rendered by the Cumberland Telephone & Telegraph (Bell) Company, as that company has no franchise in Lebanon, and will probably be obliged to remove its equipment from the city. Mr. Estes and his associates, who have the support not only of the City Council, but of the people of Lebanon as well, expect to establish connections with the other Independent lines, thus enabling them to give their subscribers connection with practically 50,000 people in Kentucky alone.

NORRIDGEWOCK, MAINE.—The Kennebec Farm & City Telephone Company, which has recently completed a line from Norridgewock to Oakland, by way of Ten Lots, and which gives connections to Madison, North Anson, Solon, Bingham, Caratunk, Athens, Starks, Mercer, Canaan and Skowhegan, is planning for the extension of its system into Waterville and Sidney.

AITKIN, MINN.—It is the intention of the Aitkin Telephone Company, which has commenced the work of reconstructing its system in this city, to install a new switchboard, and to otherwise improve its plant, making it up-to-date in every particular.

LAKE CITY, MINN.—Among the extensions planned by the Dwelle Telephone Company of this city is a line to Oak Center.

ST. PAUL, MINN.—A $15,000 branch exchange building is to be erected in this city by the Northwestern Telephone Exchange Company.

BOSWORTH, MO.—It is the intention of the Bosworth Telephone Company to rebuild its plant in Bosworth.

ST. LOUIS, MO.—The proposed addition to its present exchange building in this city, it is estimated, will cost the Bell Telephone Company of Missouri about $75,000.

MILES CITY, MONT.—The Rocky Mountain Bell Telephone Company contemplates the installation of new central office equipment in this city, and a number of improvements in its outside plant.

PLATTSMOUTH, NEB.—A new exchange building is to be erected in this city by the Plattsmouth Telephone Company, in which the most modern equipment is to be installed.

THOROFARE, N. J.—On account of the dissatisfaction caused by the service being rendered by the Bell Rural Telephone Company of West Deptford Township, arrangements are being made with the People's Telephone Company to erect lines and install telephones throughout the township.

ELIDA, N. M.—The Elida Mutual Telephone Company is erecting a new exchange building, and upon its completion expects to install in it the most up-to-date apparatus.

SANTA FE, N. M.—The Santa Fé Electric Telephone Company has under consideration extensive improvements in its plant at Santa Fé.

WILLARD, N. M.—Telephone service to Albuquerque and other points west of the mountain range is soon to be established by Willard and Estancia Valley towns, it being the intention of the Sunshine Valley Public Utilities Company, with headquarters at Willard, to connect with the line now in course of construction from Albuquerque to Moriarty.

MIDDLETOWN, N. Y.—A new line between this city and Bloomingburg is being erected by the Orange County Telephone Company, and other extensions are planned.

SCHENEVUS, N. Y.—A new switchboard has been installed by the Schenevus-Worcester Telephone Company, and connections established with the Home Telephone Company of Oneonta. Other improvements are being considered.

CANDO, N. D.—The Cando Electric Light & Telephone Company expects to construct a new telephone line 10 miles in length.

BETHEL, PA.—The lines of the Bethel & Mt. Aetna Telephone Company are being extended to Richland, and additional construction work is being considered.

CARLISLE, PA.—A farmers' telephone line is being constructed between Carlisle and Churchtown, by way of Boiling Springs and Lutztown.

LAVELLE, PA.—Work has been commenced by the Lavelle Telephone Company on the construction of a line between Lavelle and Locust Dale, and other extensions are planned.

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Condensed News Reports

LINESVILLE, PA.—A new switchboard has been installed by the Linesville Telephone Company, and many other improvements in its plant are to be made.

McVEYTOWN, PA.—The Ferguson Valley Farmers' Telephone Company, recently organized by J. C. Shahen, L. J. Ruble, M. F. K. Swigart, H. M. French and others, is soon to commence the construction of a telephone system in McVeytown, and throughout Ort Valley, Ferguson Valley to Lewistown, Huntingdon, Atkinson Mills and a number of other places.

ZION GROVE, PA.—The lines of the Farmers' Telegraph and Telephone Company are being extended throughout the Catawissa Valley, and connections will soon be established with the majority of the towns along the Susquehanna River.

BISHOPVILLE, S. C.—The Bishopville Telephone Company, which was recently organized with a capital stock of $5,000 by Thos. G. McLeod president, Robert Shelor secretary and treasurer, and H. C. Tucker, general manager, has taken over the old plant at this city, and expects to expend about $10,000 in reconstructing it. Work is progressing at a rapid rate, and it is the company's intention to establish connections with the Sumter Telephone Company.

CANTON, S. D.—A new switchboard has been installed by the Canton Co-operative Telephone Company, and many other improvements in its system are to be made.

SCOTLAND, S. D.—The People's Telephone Company, of which F. L. Wheeler is manager, and which has just completed a line to Vodnany, expects to still further extend its system.

WOONSOCKET, S. D.—The Schuler-McCurdy Telephone Company is installing a new switchboard in the exchange building which is being erected in this city. The entire system in Woonsocket is to be reconstructed, and the plant made modern in every particular.

EDISON, TEX.—Construction work on the Edison-Loma-Vista telephone line has been commenced.

HOUSTON, TEX.—The lines of the Southwestern Telegraph & Telephone (Bell) Company are being extended in Houston, and a new exchange is to be installed in the South End of the city.

OKANOGNA, WASH.—On account of the alleged dissatisfaction over the service being rendered by the Pacific Telephone & Telegraph (Bell) Company, a new telephone line has been erected by citizens of Okanogna and Riverside between the two towns. A number of telephones have been installed at each place, and service is given to a number of farmers along the route. It is probable that the line will be extended at an early date.

PORT TOWNSEND, WASH.—Arrangements are being made by the Idependent Telephone Company to extend its lines to Morganshill, Happy Valley and other portions of the residence part of Port Townsend. A new switchboard is to be installed, and a number of other improvements made.

SHEBOYGAN, WIS.—The newly organized Mosel-Centerville Telephone Company has completed the construction of its system in Sheboygan, and expects also to extend its lines into the surrounding country.

LANDER, WYO.—The Kemmerer-Pinedale Telephone Line is to be extended to Lander, Wyo., and construction work is to be commenced at once.

AIRDRIE, ALB., CAN.—The farmers in this district are building a rural telephone system which will serve about 50 subscribers.

ALMONTE, ONT., CAN.—A rural telephone system with 17 subscribers has been installed between South Mountain and Brinston Corners.

CROSSHILL, ONT., CAN.—The Wellesley & Mornington Telephone Association, which has just completed a line from Crosshill to Newton, contemplates considerable additional construction work.

HAILEYBURY, ONT., CAN.—At a recent meeting of the directors of the Temiskaming Telephone Company it was decided to construct a line to Silver Centre. A line to Elk Lake City is now under construction.

ELECTIONS

MENA, ARK.—At a recent meeting of the stockholders of the Mena & Smithville Telephone Company the following officers were elected: President, Robert Hiltebrand; vice-president, W. R. Jones; secretary and treasurer, C. A. Smith; manager, W. E. Anderson.

MARSHALL, MICH.—The following directors have been elected by the Citizens' Telephone Company of this city: L. C. Miller, V. A. Lepper, F. A. Stuart, of Marshall; C. E. Tarte, E. B. Fisher and C. F. Rood, of Grand Rapids.

OTISVILLE, MINN.—The Scandia & Marine Mutual Telephone Company, recently organized, and which has taken over the lines of the Osceola Telephone Company between Scandia and Marine Mills, has elected F. G. Morrison, of Scandia, president, and Albert Hawkinson, of Copas, secretary.

COPAKE, N. Y.—The officers of the newly organized Copake Telephone Company are: President and general manager, John D. Ackley, of New Milford, Conn.; secretary and treasurer, Willard Holsapple, of Copake. It is the company's intention to install and operate telephone lines in the southern part of Columbia County and the northern part of Dutchess.

GROTON, S. D.—The Groton-Ferney Telephone Company, which reports a rapidly increasing business, has elected the following officers: President, N. O. P. Synoground; vice-president, Chas. Rossow; secretary and treasurer, J. Wilson.

CORNERSVILLE, TENN.—The stockholders of the Cornersville Telephone Company have elected the following officers: Dr. Alf. Jones, president; W. B. London, secretary; D. C. Kennedy, treasurer. The treasurer's report showed the affairs of the company to be in excellent condition, and a good dividend was paid.

MISCELLANEOUS

WASHINGTON, D. C.—In the Daily Consular and Trade Reports, issue of July 20, announcement is made that an American consul in Mexico reports that, owing to the unsatisfactory telephone service in the city in which he is located, a very good field is open for efficient service, and that a company that will secure a concession, and guarantee to give satisfactory service, with a modern and up-to-date system, is sure to be successful. Fur further particulars write to the Department of Commerce and Labor, Bureau of Manufactures, Washington, D. C., mentioning the date of the report, and stating that the item in question was No. 2435 under Foreign Trade Opportunities.

BRISTOL, IND.—It is the intention of the Merchants' Mutual Telephone Company of Michigan City to take over the plant of the Central Union Company at Bristol, Ind.

GASTON, IND.—The Gaston Home Telephone Company, recently organized at this city on account of the inability of the citizens to secure satisfactory service from Central Union (Bell) Telephone Company, has commenced business with 175 subscribers, and expects within a month to have increased the number to 400. Arrangements have been made whereby the new comany will use the Delaware & Madison Counties telephone system for long distance connections.

WALKERTON, IND.—Fire at this city destroyed the building occupied by the Walkerton Independent Telephone Company, and it is stated that the company sustained a $5,000 loss.

YORK, NEB.—The Independent copper trunk toll lines between Columbus, Seward and Grand Island have been acquired by the York County Telephone Company, an Independent concern, and arrangements are being made to extend them to Ravenna and a number of other points.

FORT PLAIN, N. Y.—Arrangements are being made for the installation of an up-to-date telephone system in Fort Plain and Canajoharie, to operate in competition with the Glen Telephone (Bell) Company of Gloversville and Johnstown. The Interstate Telephone Company in Little Falls is possessed of franchises permitting it to operate in both Fort Plain and Canajoharie, and has maintained stations and given service in both places. An offer has been made to the Interstate Company by the East Springfield Telephone Company, which operates a line between Springfield and Cherry Valley, and which is said to have about 1000 subscribers, to lease its rights and franchises in the two villages named. If the negotiations can be satisfactorily concluded, it is the purpose of the East Springfield Company to rebuild the entire system in these two places and operate the plants in connection with its present system.

OREGON CITY, ORE.—The Farmers' Independent Telephone Company of this city has been reorganized, and the following directors elected: A. A. Andrews, C. G. Huntley, Thomas F. Ryan, R. B. Beatie, O. D. Ebey, J. U. Campbell, John Lewellan. The company, which has connections with Clear Creek, Molalla and Beaver Creek, is planning to improve and extend its system.

PANHANDLE, TEXAS.—The telephone system at this city, formerly the property of R. M. Franklin, has passed into the possession of the Nunn Telephone Company of Amarillo.

UNDERGROUND

DECORAH, IA.—An up-to-date conduit system is being installed in this city by the Standard Telephone Company.

OSKALOOSA, IA.—The new ordinance requiring telephone companies to place their wires underground has been passed, making it possible for the Home Telephone Company to commence the construction of its conduit system.

SAGINAW, MICH.—The Michigan State Telephone Company is placing some of its wires underground in this city.

ST. LOUIS, MO.—The Bell Telephone Company of Missouri is to place a number of its wires underground in this city.

PATERSON, N. J—It is the intention of the New York & New Jersey Telephone (Bell) Company to install a conduit system in Paterson.

POUGHKEEPSIE, N. Y.—In compliance with the city ordinance, the Dutchess County Telephone Company is placing its wires in conduits in this city.

HUDSON, OHIO.—A request has been made by the City Council that all telephone wires be placed underground in Hudson.

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WANTED

The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.

HELP WANTED

The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—A first-class telephone man who can make a small investment. The investment will be quite secure and will show remarkably large profits; an exceptional opportunity for the right man. Address No. 1155, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

A SUCCESSFUL, progressive telephone manager, having entire charge of all departments of a system consisting of several exchanges, wishes to make a change. East or South. Past record A1. Address Box 1123, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

A TELEPHONE man with 11 years' experience in equipment, traffic and commercial departments with one company, would like to make a change. Present position manager central energy plant of 2250 subscribers. Best of references. Address No. 1153, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED.—Permenant position, by competent young man, experienced as manager; capable of handling the business, as well as the electrical end. Eight years' experience: good habits; best reference furnished. Address No. 1154, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED.—By a strictly first-class, up-to-date telephone manager and const. man; 12 years' experience from the ground up. Specialty, overhauling run-down plants. Present position, manager 900 telephones. Highest recommendations. Will give you my services 30 days free if I don't deliver the goods. Salary $80. West preferred. Address H., care of Downing Electric Company, Fort Dodge, Iowa. 1149

FOR SALE

This column is open only to operating companies to sell telephone plants or second-hand apparatus. The rate for advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

FOR SALE.—One No. 1, 5-ton, Gibbs Engineering & Mfg. Co.'s electric truck with winch hoist, pulling capacity 6000 lbs. Contains 44 cells of 19 M V exide batteries, complete. Solid rubber tires, 7" x 36". Bed of truck is 15' 7" long and 6' 8" wide. This machine with its winch hoist can be used to great advantage in pulling cable. This truck is in excellent condition and will be sold at a sacrifice. Apply to THE BELL TELEPHONE COMPANY OF MISSOURI, St. Louis, Missouri. 1152

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"HIGH DUTY"

Aren't you interested in a storage battery that stays in good condition?

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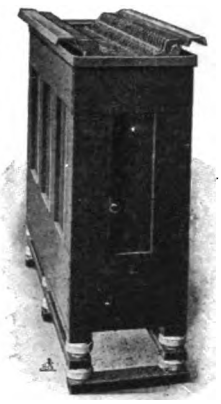

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get it with
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No levers, springs, nor trouble. Quick service and low maintenance. Catalog Number Fifty is without price. Write for a copy.
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We have on hand newly manufactured, guaranteed apparatus of all makes

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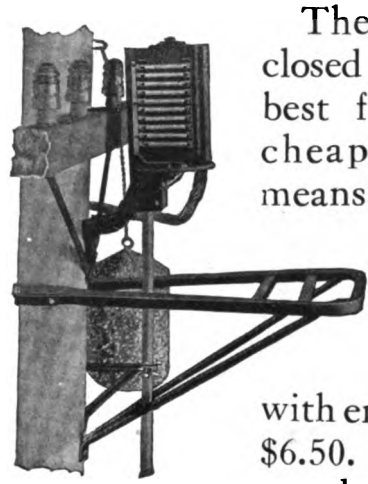

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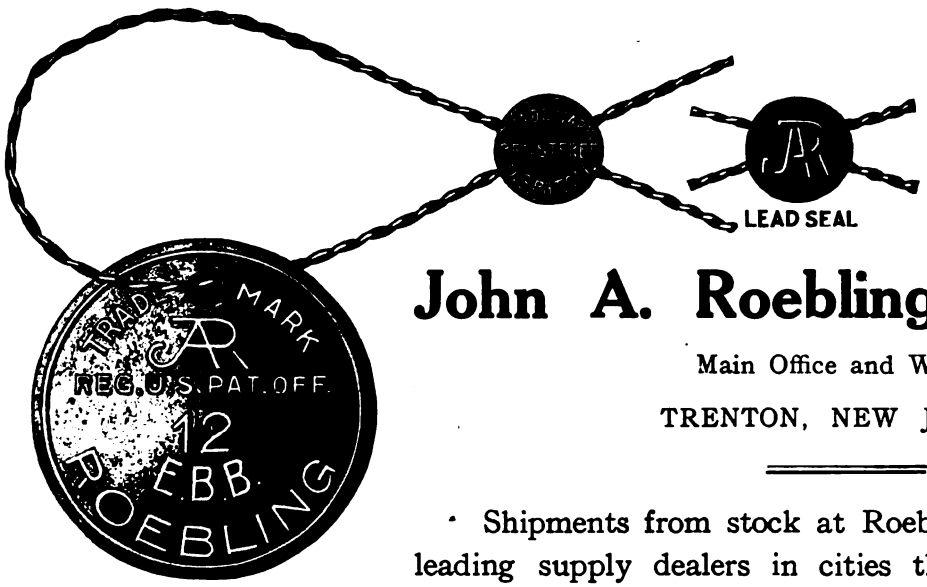

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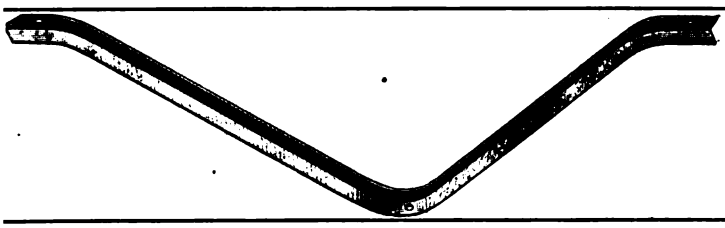

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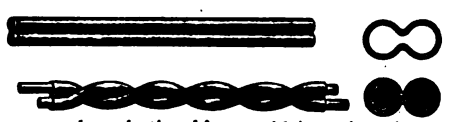

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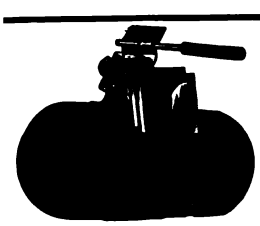

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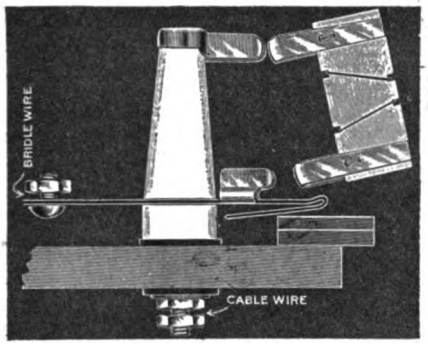

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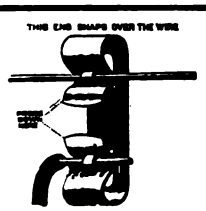

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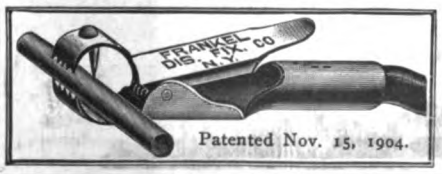

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¶ **Results** prove the worth of STROMBERG CARLSON Registered Trade Mark Cords. **Think** of the economical advantages of using cords that may be depended upon for indefinite service.

¶ **From Iowa** we have an unsolicited statement that

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¶ Nothing as good is so cheap—nothing as cheap is so good.

If interested—even a little bit—write to-day.

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COOK

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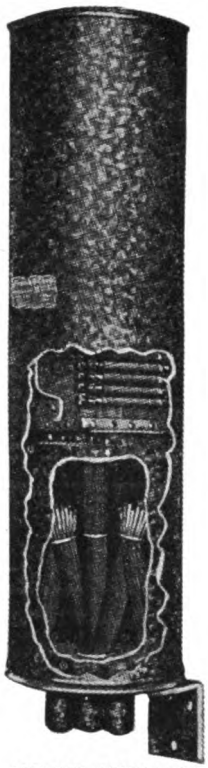
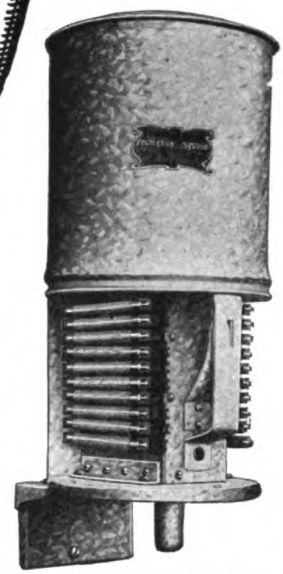


COOK NEW JUNCTION BOX AND TERMINAL COMBINED

Investigation and investment go hand in hand when telephone men become interested in Cook Specialties.



TYPE S-6. COOK POLE CABLE TERMINAL

Frank B. Cook

238 WEST LAKE STREET

CABLE TERMINALS

¶ This is one of our Specialties. They combine low first cost and maintenance with absolute protection.

¶ Use our **Galvanized "T" Brackets** for two and four pairs of wires for distributing.

¶ Ask for samples and booklet of Construction Specialties.

MOUNTAIN STATE ELECTRICAL CO.

Wheeling, W. Va.

No. 700. American Aerial Arrester

Price, 35c Each

It Keeps the Lightning Out

Lightning currents coming upon the line wire and reaching the arrester flow through the two line clips mounted upon the brass shell. Inside this shell is a carbon rod, its outside surface being very close to the inside surface of the brass shell. The lightning jumps across the small air gap from the brass shell to the carbon ground rod and thence flows off harmlessly to the earth through the end clip and the ground wire.

AMERICAN ELECTRIC FUSE CO.

Muskegon, Mich.

EASTERN SALES OFFICE, MORTON BLDG., NEW YORK, N. Y.

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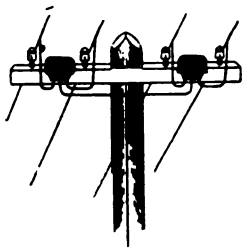


In Ancient Times

a feather bed was supposed to offer the best lightning protection.

THE MODERN METHOD

is to use

Chapman Lightning Arresters

All the big boys are using them

Manufactured by

Minnesota Electric Co.

Minneapolis, Minn.

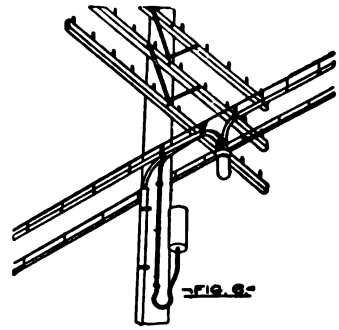
H. E. COBB, Selling Agent

1530 Monadnock Bldg. Chicago, Ill

Matthews' Cable Splicing Joints

(Formerly called Hargis Joints)

Patented Oct. 17, 1905



Patent Number 802,337

Figure 6 shows a No. 3 Matthews' Joint used for the purpose of joining together a 200 pair main cable, a 100 pair extension, a 75 pair branch and a 25 pair tap. This drawing was made from a photograph furnished us by R. Cline, Supt. of Construction of The Central Union Telephone Co., Indianapolis.

Your cables could not possibly get water soaked even if Matthews' Joints were defectively installed. If your splicer left a leak, the water would go down into the lead pot. When your trouble man arrives he will unscrew the sleeve, remove the water, drive out the condensed moisture with his hot paraffine, solder up the hole in the top of the joint and screw on the sleeve. See our ad. in Aug. 1 issue.

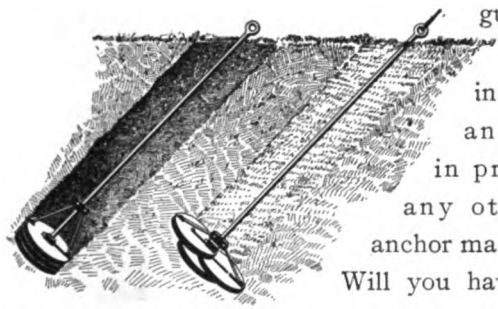
A 32-page booklet on Cable Splicing will be sent free to anyone.

W. N. MATTHEWS & BROTHER

Manufacturers of Patented Money-Saving Specialties

214 NORTH SECOND STREET ST. LOUIS

The "EVERSTICK"



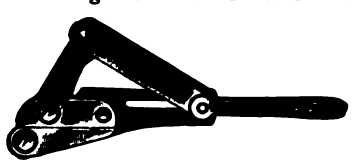
guy anchor is higher in efficiency and lower in price than any other guy anchor made. Will you have proof?

SPECIALTY SALES COMPANY

Cedar Rapids, Ia.

KLEIN'S NEW "CHICAGO GRIP"

is made of steel forging, polished and nickel plated. It is a well-proportioned and reliable tool. The draw link is arranged so it does not fall in the way of the wire. It holds fast on iron or copper wire. Do not fail to have our Catalog on file. It is arranged with Code and List numbers for convenient ordering.



No. 358-A, for No. 6 Wire and Smaller.

All prominent supply houses carry our products.

MATHIAS KLEIN & SONS, 87 W. Van Buren St., Chicago, Ill.

They Meet Every Condition

Sky Rocket Arresters

will effectively take care of any excessive potential charge on your lines —positively, infallibly.

They'll save many times their cost every year.

We're ready to talk price.

CHANCE MANUFACTURING CO.

CENTRALIA, MO., U. S. A.

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National Pole Company

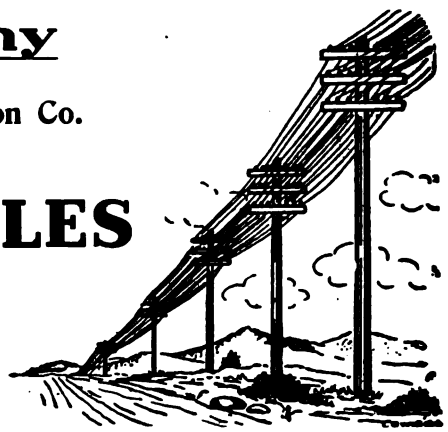
SUCCESSOR TO

Cedar Department of Pittsburg and Lake Superior Iron Co.

ESCANABA, MICH.

LARGE STOCKS OF POLES

Yards from Maine to Washington



The Valentine-Clark Co.

ERNEST L. CLARK, President

Michigan / Western } Cedar Poles Exclusively

All stock concentrated in our main yards

Minn. Transfer, Minn. — Green Bay, Wis.
Prentice, Wis. — Pinconning, Mich.

MAIN OFFICE

234 La Salle Street — Chicago, Ills.

DOTY LUMBER AND SHINGLE CO.

Manufacturers of

Washington Fir
Cross Arms. Red
Cedar Poles and Piling.
In any length.

PROMPT SHIPMENTS

Doty, Washington

CEDAR POLES

Have a large stock. Write us for delivered price.

MARSHALL H. COOLIDGE CO.

826 Metropolitan Bld. - - - - MINNEAPOLIS, MINN.

GOOD FROM A TO Z

BISSELL ARMS AND PINS

Good Yellow Pine, *good* Washington Fir, *good* Locust, *good* mill work, and *good* low prices. Special sizes a special delight.

Write for Leaflet Three.

THE F. BISSELL COMPANY, Toledo, O.

WHITE CEDAR POLES

LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—

YARDS: MENOMINEE, MICH. ESCANABA, " SUPERIOR, WIS. DEER RIVER, MINN.

FRANCIS BEIDLER & CO.
CHICAGO, ILL.

POLES Western Red and Michigan White Cedar

LONG POLES A SPECIALTY

FARIS & MAYHEW LUMBER & POLE CO.

202 & 203 Continental Building, Denver, Colo.

WHITE CEDAR POLES

Buy from the Producers
and Save Jobbers' Profits

PENDLETON & GILKEY, - Minneapolis, Minn.

Northern White Cedar

POLES

ITASCA CEDAR COMPANY
Deer River, Minn.

White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000 BY APRIL 1st. 26 YEARS HAVE WE BEEN PRODUCING POLES. WRITE US.

Yards: Omer, Bay City and Boyne Falls. W. C. Sterling & Son Co., Monroe, Mich.

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Evidence of our ability to meet all trade demands:

New customers constantly coming our way

POLES

We have the "goods" and the facilities for supplying you promptly at right prices.

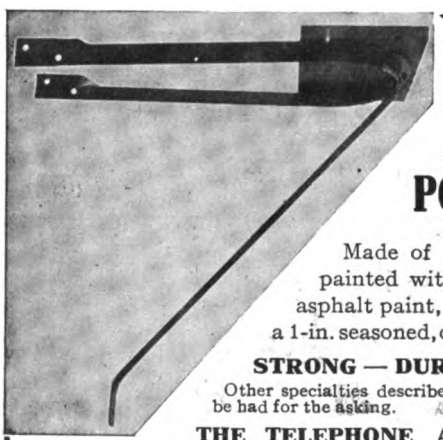
Duluth Log Company

General Offices: Second Floor, Palladio Bldg.
Duluth, Minnesota

Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

C. H. Worcester Co.
Tribune Building, Chicago



$1.00 YANKEE POLE SEATS

Made of 1½-in. angle iron painted with a weather-proof asphalt paint, to which is bolted a 1-in. seasoned, creosoted pine seat.

STRONG — DURABLE — CHEAP

Other specialties described in our bulletin may be had for the asking.

THE TELEPHONE APPLIANCE CO.
MINNEAPOLIS, MINN.

IDAHO AND MICHIGAN
CEDAR POLES
Large Stocks (16 Yards) Low Prices
Idaho Red Cedar Poles Our Specialty
Western Lumber & Pole Co.
SUITE 416 CHARLES BUILDING • • DENVER, COLO.

LARGE LOTS of LONG POLES
Well Seasoned White Cedar
Immediate Shipment
J.W. Morrison Lumber Co.
General Office: 919 Lumber Exchange, Minneapolis

POLES AND PILING Chestnut, Red Cedar and Cypress Lengths 16 to 65 feet
J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.
PORTER CEDAR CO., Saginaw, Michigan

WHITE CEDAR POLES
Prompt Shipment Best Grade
Standard Cedar & Lumber Co.
34 SECURITY BANK BUILDING, MINNEAPOLIS, MINN.

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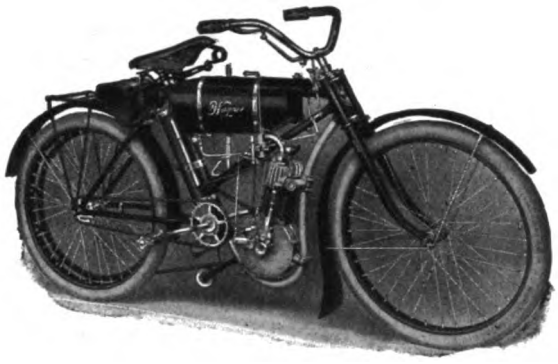


The Wagner Motorcycle

SIMPLE PRACTICAL ECONOMICAL

The quick transportation for

Lineman, Inspector, Collector, "Trouble-shooter"

Descriptive catalog and particulars of our special proposition to the Telephone Trade upon application.

Wagner Motorcycle Company

St. Paul, Minn.

ANDREWS STEEL ROD TELEPHONE

Operator's Revolving Chair

Steel Foot Rest—Seat and Back readily adjustable to occupant—Height of Chair easily regulated. Frame work made of Bessemer Steel, ⅜ (three-eighths) inch rods twisted and interwoven. Wood work, oak, birch or mahogany finish, as preferred. Metal work heavily plated, Japanese copper finish.

No. 78 M.

The Most Comfortable High Chair Made

The Most Attractive and Convenient

INDESTRUCTIBLE

Nothing to get broken

24-inch high 28-inch high

Warranted for 10 years. Send for complete Catalogue and Prices

The A. H. Andrews Co.

174-186 Wabash Ave.
Chicago, U. S. A.

No. 75 M. Toll Board Chair.

WE MAKE TOLL TICKETS BY THE MILLION

By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
Toll Journals	Trouble Tickets
Toll Ledgers	Rental and Toll Bills
Monthly Check Reports	Voucher Checks
Cash Books	Card Index Systems

Steel Telephone Signs

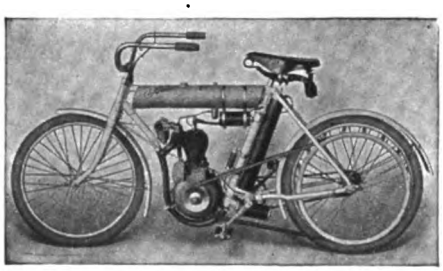
All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY

DEFIANCE, OHIO

ARMAC MOTOR CYCLE



Mr. HELLO MAN—

Every day you are losing money when you don't use an ARMAC MOTOR CYCLE for trouble men.

WRITE US TO-DAY FOR THE FIGURES.

ARMAC MOTOR CO.

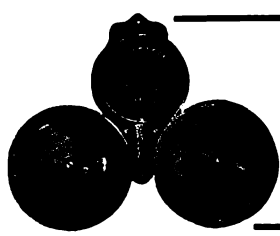
1221 Michigan Ave. CHICAGO, ILL.

TELEPHONE MANUFACTURERS

CARBON 95% PURE

Our imported granular carbon will carry, without frying, three times the amount of current required. Carbon brushes, self oiling. "Remey" magnet steel—the world's standard. Imported tin foil. Copper thread. Condenser paper—the most perfect made. Mica.

W. J. Burns & Co., Agents for Factories—Foreign and Domestic **509 Northwestern Bldg., Chicago**



Magneto LOUD RINGING Extension

TELEPHONE BELLS

Size of gongs, 6 in., 7 in., 8 in., 9 in., 10 in. All resistances. All weather proof. Efficiency, durability and price will interest you.

SCHWARZE ELECTRIC COMPANY

Main Office and Factory: Adrian, Michigan

TELEPHONE EAR CUSHION Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the ear-drum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash! crash! noises. Made by

HURON RUBBER COMPANY, CLEVELAND, O.

THE AMERICAN TELEPHONE JOURNAL HAS A LARGER CIRCULATION THAN ANY OTHER PAPER IN THE FIELD

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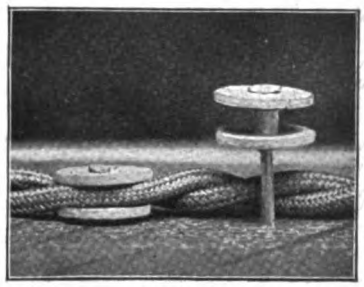
EUREKA FIBRE INSULATORS

A NEW STYLE

"PRICES TO POINT WHERE IT IS ECONOMY TO USE THEM"

The value is in the method that they are attached without injury to the wire.



Made in Three Types 50, 60, 70 $\frac{3}{4}$", $\frac{7}{8}$" and 1" long, respectively.

PRICES AND SAMPLES ON APPLICATION

COMMERCIAL ELECTRICAL SUPPLY CO.

Fifteenth and Pine Sts. **ST. LOUIS, MO.**

The Ace High on Quality

The Deuce Low on Prices

1908 Apparatus and 1908 Prices

Central Telephone & Electric Company

ST. LOUIS **Everything Telephonic** **DALLAS**

Attach this advertisement to request of Telephone Company for prices—you get a pack of Shield Emblem Cards—we get the Orders.

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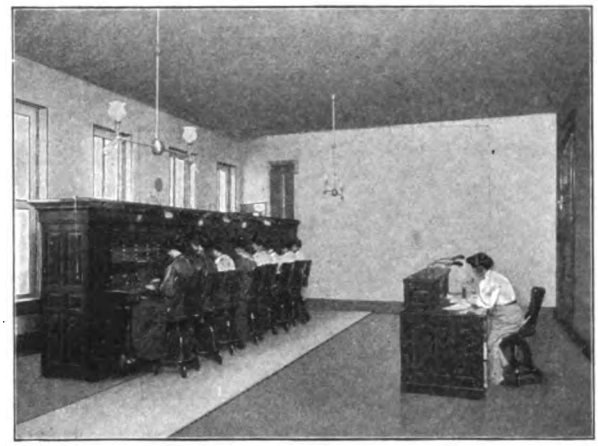

Dean C. B. Multiple Board at Mt. Vernon, Ohio

Manual vs. Mechanical

From the Subscriber's standpoint, the most complete labor saving service is obtained with the best manual telephone exchange—the Dean Common Battery Multiple Switchboard.

The Mere Removal of the receiver from the hook makes the call. Replacing the receiver insures immediate disconnection, in the most simple manner.

The Human Element—the operator—is as necessary, and not as expensive, as the many trouble experts required to maintain any mechanical exchange.

The Poorest Operator, with her continual application to simple duties on a Dean board, is at least on a par with the most careful subscriber who makes his own connections.

Expert Supervision of telephone service is absolutely necessary—the best results cannot be obtained where the subscriber is his own operator.

The Average Service on a Dean switchboard is therefore far superior to the best service obtained with any other system.

The Results need no argument.

Labor Saving Devices on Dean manual switchboards, make the work of connecting and disconnecting more positive, rapid and accurate than is possible with a mechanical or any other switchboard.

The Smallest Possible number of switchboard parts, in proportion to the number of subscribers served, is what makes the cost of Dean exchange up-keep practically nothing.

This Is True also of subscribers' apparatus. Simplicity of equipment is vital to good service and to economic maintenance. The high grade, superior design and expert construction of Dean apparatus has never been questioned.

Taking These Facts into consideration, is it not reasonable to count on the most profitable return from investment in a Dean exchange?

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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COMBINATION SWITCHING TELEPHONE

FOR CONNECTING FIVE FARMERS' LINES

¶ If you have ever attempted to do any switching on a farmers' line by means of knife switches you realize how much trouble it is and the time it takes. Here is a telephone switchboard that has proven to be a much more rapid, practical and positive device and is intended for systems that will never require more than five (5) farmers' lines.

THE OPERATION OF THE SWITCHING DEVICE

¶ **To Call a Party**—Insert the **calling plug** in the jack corresponding to that line and then give the proper number of rings.

¶ **To Answer a Call**—Insert the **answering plug** in the jack of that line from which the call came.

¶ **To Connect Two Lines**—When a party calls ascertain whom they want on any of the other lines; call the party wanted: then connect the two lines with the **connecting plug.** To listen in when two parties are connected, insert the **answering plug** in the **home** or **listening jack.**

QUALITY APPARATUS

APPARATUS EXCELS

CODE No. 573 TELEPHONE

A COMPLETE SWITCHING DEVICE

¶ The ringer on the **Combination Switching Telephone** is connected to line **No. 3**—binding posts *E* and *F*. It is necessary to provide a **No. 300**—1600-ohm **Extension Bell** for Lines Nos. 1, 2, 4 and 5. The regular bridging extension bells should be wound to the same resistance as the telephones on the line with which they are used.

IT COSTS LITTLE MORE THAN A TELEPHONE
WRITE FOR PRICES AND BOOKLET No. 109

STROMBERG-CARLSON TEL. MFG. CO.
ROCHESTER, N.Y.-CHICAGO, ILL.

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"Waiting Action of Bell Company"

That notation opposite several companies' names on our prospect list, spells inaction. It also calls to mind the Fable of the Tortoise and the Hare. Do you remember that the hare thought himself such a Live Proposition that after running part of the race, he could safely lie down and snooze till the Tortoise caught up to him and then beat the Slow Guy by a couple of hops? But he overslept and the Tortoise plodded by and won.

The Independent Company

that has made a part of the race and then deceives itself into the belief that it can lie dormant "waiting action of the Bell Company" is liable to wake up and find the race lost.

Just remember

that you can't afford to stop running in the race for business. Keep your plant at the top notch of efficiency all the time and don't wait to make improvements till your competitors force you to. Force them, don't let them force you.

Buy Automatic now

and keep ahead of your competitor. Don't wait to see what your competitor is going to do. Improve now and with Automatic.

Our Automatic System has been adopted in the following cities:

Aberdeen, S. D.
Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Benton, Minn.
Lansing, Mich.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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"ROBERTS" AND WHAT IT MEANS

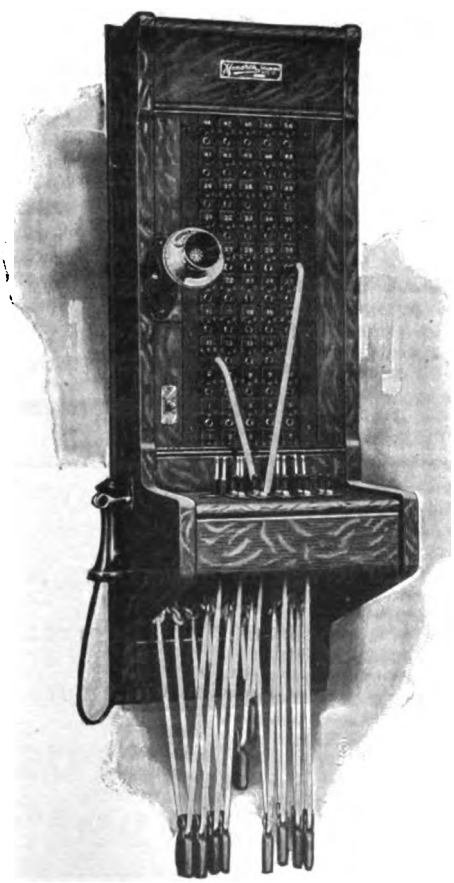
10 The Roberts System offers the following strong advantages: Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, Etc., and adaptability to any existing local battery exchange.

Costs and Revenues

The Roberts System works two ways for the treasury—by reducing costs and by increasing revenues. The Roberts features of complete automatic supervision, complete control of line by operator, the call signal, the excellent transmission qualities and general good character of the service rendered, enable a Roberts installation of stated line capacity to handle at least 50% more traffic than an installation of like stated capacity of any other party-line system. Thus the saving in construction cost alone will more than offset the small extra cost of Roberts apparatus. The reduction in the number of circuits required, the operator's ability to locate and define all kinds of trouble and the time and labor-saving devices previously described combine to effect a very considerable reduction in maintenance and operating costs, as well.

We have shown other operators that phone users, if given the choice, will readily pay from 25% to 50% more for Roberts than for bridged line service, and we will show you if you give us a chance. We will also show you that a great many straight-line subscribers may easily be induced to take Roberts party-line service. Write for literature.

HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago



IN SMALL EXCHANGES

Where a repair man is not always available it is important to have equipment that will not get out of order easily. This is one of the reasons why so many Monarch boards are used.

The simplicity of design and careful construction which keeps the small boards free from trouble is also apparent in the large boards and causes the low cost of maintenance, which is a feature of Monarch private branch and multiple boards.

If you want a small switching station or the equipment for a large exchange we will be glad to submit figures.

Let us send a catalogue.

MONARCH TELEPHONE MFG. CO.

Factory and General Office:
Washington and Morgan Streets
CHICAGO, ILL.

Branch House:
177 Main Street
DALLAS, TEX.

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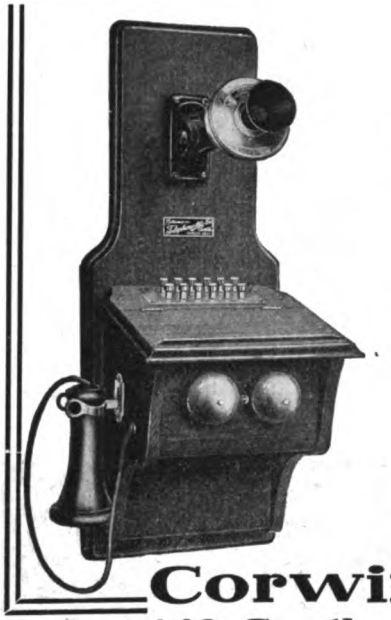
Corwin

Automatic Intercommunicating Telephones



Ours is the common sense system, and experience shows it. All complication is eliminated. No jacks, plugs or cords, no short circuits or poor connections. Reliable, positive contact and superb wearing qualities insured by our combined ringing and talking key. One button to each line—that's all. See the catalog.

Corwin Telephone Mfg. Co.
149 South Clinton Street **Chicago**

Perfect Non-Interfering Operation on Exchange Lines

as well as on the local system is only one of the reasons why you shou'd use Connecticut Automatic Intercommunicating Telephones.

Fully described in Catalog 10..

Conn. Telephone & Electric Co., Inc.
Meriden, Conn.
Send for Catalog T

"REBUILT"
TELEPHONE EQUIPMENT
Is "REBUILT," not "REPAIRED"
One's like "New," the other's "Old"---always will be

Our "Rebuilt" Equipment Department "Rebuilds" Switchboards—Telephones—Apparatus—Additional Switchboard Equipment—and Handles Wire—Cable—Cords—Everything Telephonic.

GUARANTEED SAVING 30 TO 50 PER CENT.

Get Quotations, and if you want our "Rebuilt" Bargain Bulletin sent you regularly—say so—it's FREE. *Address*

"REBUILT" EQUIPMENT DEPARTMENT
PREMIER ELECTRIC CO.
56 W. VAN BUREN STREET, CHICAGO, ILL.
Remember "Rebuilt"—that's OUR word

TELEPHONE EAR CUSHION Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the ear-drum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash ! crash ! noises. Made by

HURON RUBBER COMPANY, CLEVELAND, O.

Magneto LOUD RINGING Extension
TELEPHONE BELLS

Size of gongs, 6 in., 7 in., 8 in., 9 in., 10 in. All resistances. All weather proof. Efficiency, durability and price will interest you.

SCHWARZE ELECTRIC COMPANY
Main Office and Factory: Adrian, Michigan

A dollar saved in advertising is not always earned. The most costly dollar some advertisers ever possess is the one they do not spend.—*Exchange.*

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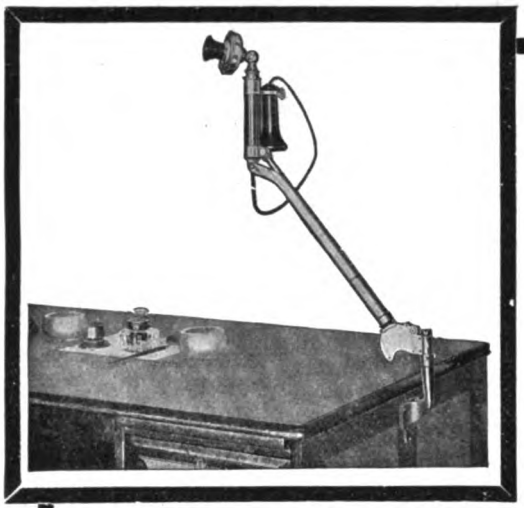

A Producer Of New Business

The FLEXIPHONE

You can easily get new subscribers if you tell them you will install the FLEXIPHONE, and even get a higher rental. Many companies are using it, as it

REDUCES THE MAINTENANCE ACCOUNT OVER ONE-HALF

Positively does away with broken Transmitters and Receivers. It overcomes those annoying cord troubles

ATTACHES TO ANY WOODWORK—ANYWHERE

Any Standard Transmitter or Receiver can be used.

MAY WE SEND YOU A SAMPLE FOR TRIAL?

Oliver Manufacturing Co. 1020 Walnut Street PHILADELPHIA, PA.

Holtzer-Cabot Electric Co. BROOKLINE, MASS. CHICAGO, ILL.

If You Consider THE POOLE Lock-Out System

as an addition to party-line service, you are wrong.

It is not something added—it is a feature which has always belonged to good service. It unfailingly gives absolute

Secrecy

to any of the parties on the line. It gives the subscriber all the advantages of a private line at the cost of a party line. It enables you to put more parties on a line, and get higher rates.

Now, do you want details?

Mountain State Electrical Co.,

Wheeling, W. Va.

To inspect the hook switch, loosen the knurled nut at top of stem. You do this with your fingers: there are no mysterious "catches" or patent spring locks to monkey with.

As soon as the nut is loose, the casing may be removed. Now you can see every working part and every wire, and yet every part is operative. There is not a sliding contact in the stand. Every connection is soldered.

By removing one screw in the center of the base, the cord terminals are reached. These are of generous size, so you don't need a watchmaker's screwdriver to put in a new cord.

The hook lever is the part that usually "gets it" when the stand is knocked over, so we put this on with a screw. Another lever can be put on in an instant, as shown. No adjustments.

WHY do some stands pull apart into many different pieces? You can't test them when they are apart, and can't see the parts when they are together. What's the use?

Get our Bulletin No. 63

The Sumter Telephone Mfg. Co.

SUMTER, S. C.

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U. S. COMBINED

CASH REGISTER and PAY STATION

GIVE THE BEST SERVICE

Single Gong only — A Cash Ticket with every collection

NO ERRORS — CASH ACCOUNTED FOR

THE UNITED STATES COIN REGISTER CO.

MONROE, MICH.

Operator's Calling Device

BAIRD PARTY-LINE

SECRET-SERVICE

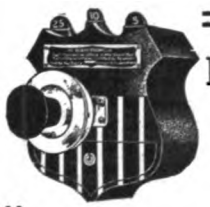
TELEPHONE SYSTEM

Nineteen or less parties on one magneto line. All "rubbering" prevented.
The very best toll service from any telephone without interference or listening in.
Absolutely private service insured to every subscriber.
A long list of delighted customers show approval by many repeat orders.
Every telephone controlled by operator, who can lock in or lock out.

Write for Catalogue and Testimonials.

BAIRD MANUFACTURING CO., 1602 North Halsted Street, Chicago

Write for Baird Pay Station Bulletin No. 250.



Earnings Rise Where Gray Pay Stations Are Used

Any telephone man who wants proof of this statement can have it for the asking. Also Catalog No. 50.

GRAY TELEPHONE PAY STATION CO.

HARTFORD, CONN.

MAINTENANCE COSTS REDUCED

High-tension oscillations absorbed by the

Mansbridge Dreadnought Self-Sealing Condenser

It stands 500 volts permanently, 1000 volts momentarily, and can readily be made for higher voltages. Small, light and inexpensive.

Patented by

G. F. MANSBRIDGE

St. Margarets, Sanderstead, Croydon, England

But manufactured in the United States.

New York Office: Care of Louis Dejonge & Co., 71 Duane Street.

Applications for license to manufacture should be addressed to the Patentee.

WE MAKE TOLL TICKETS BY THE MILLION

By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
Toll Journals	Trouble Tickets
Toll Ledgers	Rental and Toll Bills
Monthly Check Reports	Voucher Checks
Cash Books	Card Index Systems

Steel Telephone Signs

All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY

DEFIANCE, OHIO

ANDREWS STEEL ROD TELEPHONE

Operator's Revolving Chair

No. 78 M.

Steel Foot Rest—Seat and Back readily adjustable to occupant—Height of Chair easily regulated. Frame work made of Bessemer Steel, ⅜ (three-eighths) inch rods twisted and interwoven. Wood work, oak, birch or mahogany finish, as preferred. Metal work heavily plated, Japanese copper finish.

The Most Comfortable High Chair Made

The Most Attractive and Convenient

INDESTRUCTIBLE

Nothing to get broken

24-inch high — 28-inch high

Warranted for 10 years. Send for complete Catalogue and Prices

The A. H. Andrews Co.

174-186 Wabash Ave.
Chicago, U. S. A.

No. 75 M. Toll Board Chair.

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PREMIER STEEL CORD

ALWAYS IN ALIGNMENT

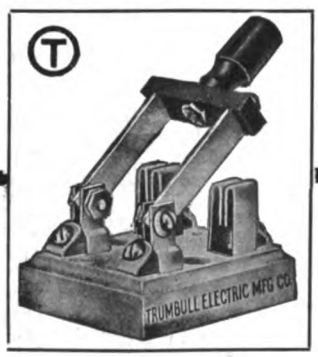
In the hollow of the cord at the plug end, there's a reinforcing spring made of the highest grade spring steel. Not only does this prevent the conductors from being thrown out of alignment, but it also makes it practically impossible to break the cord at the plug end, and that's where the strain is greatest. Operators don't have to be careful when you use Premier Steel Cord—it'll last in spite of shamefully careless usage. Better get details.

Runzel-Lenz Electric Mfg. Co.

97-101 South Clinton Street, Chicago

TRUMBULL TELEPHONE SWITCHES

AT GREATLY REDUCED RATES



Self-adjusting clips held firmly in the recesses in the base insure a proper alignment and prevent loose, resistance introducing contacts. Selected high-grade porcelain only used for bases. Each switch undergoes thorough test and inspection before leaving our factory.

THE TRUMBULL ELECTRIC MFG. CO.

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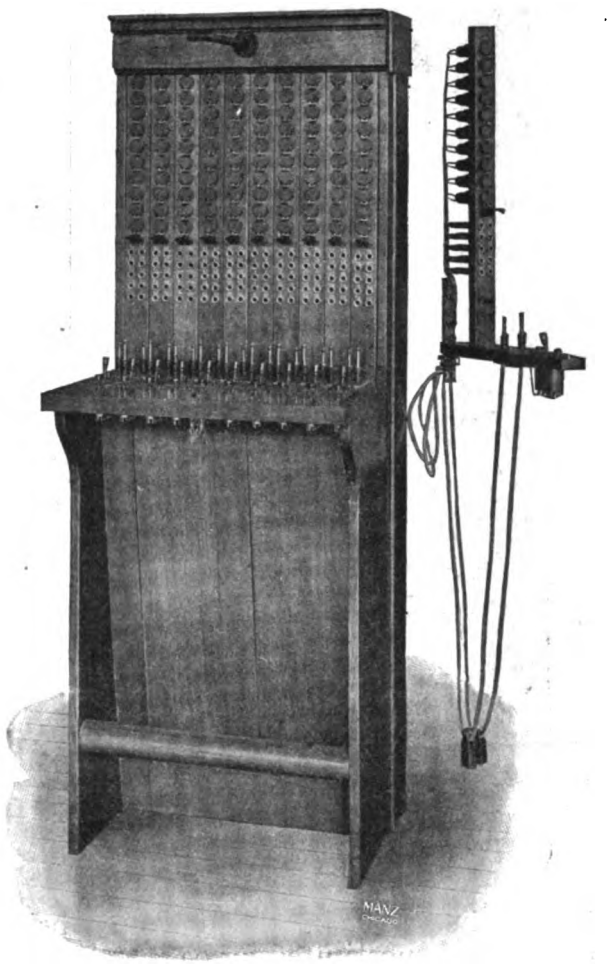

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Cabinet made any size. Drops and Jacks mounted in strips of ten each. Each strip complete with RINGING and Listening Key and one pair of cords and plugs. Buy cabinet; add strips as required.

Write for Prices

STERLING ELECTRIC CO.

GOOD GOODS

La Fayette, Ind.

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High Grade Telephone Booth

Buffum Tool Company

Louisiana, Mo.

WHY not get a good booth, that will please you and your customers, both as to utility and appearance?

Size:—

These booths were built especially so they would be convenient for the party using them and also that at the same time, (as space is often valuable) to not have them any larger than actually necessary.

The outside measurement of the booth is 33½ inches by 39 inches and 7 feet high.

The inside measurement is 26½ inches by 32 inches. They are made in one size only.

Material:—

Too often booths are not made of good material and workmanship *throughout;* the inside, the back and the top often being slighted as to workmanship, and also elm or other wood substituted for oak.

These booths are made both inside and outside of first grade oak and of nice grain, and present a good appearance.

The glass in both doors and also the side windows of the booth is not only the best quality, but it is also *double strength.*

The inside glass is arranged for removal for cleaning purposes.

The finish is of Golden Oak, and only the best Murphy varnish used throughout. The hardware is of good quality.

Construction:—

The very best of workmanship has been put on these booths, and the walls, doors, sides and top are all made double with air space so as to make them as sound proof as possible.

The top is removable in one piece. The sides are interchangeable, so if the booth is moved to another place and the glass wanted on the other side, it can be so changed. The floor is made in one piece.

The booths are paneled inside, (including the top). On the outside, the panels are raised and these panels are nicely moulded and not as usual left plain.

The four corners have nicely fluted pilasters with carved caps and the cornice is nicely dentaled, making an ornamental as well as a serviceable booth.

Booths are shipped as desired, either knock down or set up, as shown.

Price, boxed and delivered at depot, Louisiana, Mo., $50.00, net cash.

BUFFUM TOOL COMPANY

LOUISIANA, MO.

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

VOL. XVIII. NEW YORK, SATURDAY, AUGUST 15, 1908. No. 7.

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239 WEST THIRTY-NINTH STREET, NEW YORK.

TELEPHONE CALL: 4700 BRYANT.

CHICAGO OFFICE.....590 Old Colony Building
CLEVELAND OFFICE.....1015 Schofield Building
PHILADELPHIA OFFICE.....Real Estate Trust Building
EUROPEAN OFFICE....Hastings House, Norfolk St., Strand, London, Eng.

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Discrimination by the American Express Company

The action of the American Express Company in discontinuing the use of telephones operated by Independent companies is of sufficient importance to demand consideration and action wherever this company maintains an office in a town having an Independent telephone exchange. For some weeks past reports have been coming in from one place after another showing that Independent telephone service had been discontinued by this company as a result of an order issued from headquarters on the stated grounds of economy. An investigation which was promptly undertaken and vigorously carried on by Mr. A. C. Lindemuth, for the International Independent Telephone Association, seems to have shown very conclusively that the selection of the telephone to be discontinued was, in a large proportion of cases, not even based upon the comparative merits of the service of the two competing companies. The International Association has in its possession data which show very conclusively that there have been instances where the company has deliberately deprived itself of communication with the larger proportion of telephone users by the discontinuance of its Independent service.

Accordingly there seem to be good reasons for the belief, which is now so widely prevalent, that this company has, either wilfully or through the ignorance of its executive officers, been practicing unfair and unbusinesslike discrimination against the subscribers of Independent companies. Representations to the general manager of the express company by officers of the Association and others have brought forth a statement that the company would restore Independent telephones if no charge were made for their use. This free service would be illegal in some States and in others the proposition is being treated with the contempt which it deserves.

It is now sure that the only way to bring about the cancellation of this unfair and objectionable order is by prompt and decisive protest from the interested companies. While the subscribers connected with the Independent exchanges suffer inconvenience by the discontinuance of the service, the real and immediate loss of business falls upon the express company, and it is for the Independent companies to show to its executive officers just how heavy this loss is likely to be. Nowadays business communication follows the line of least resistance, and the telephone wire is the guiding influence affecting the distribution of an enormous amount of trade. The convenience of express office connection, while valuable, is but a single small factor in the make-up of the total value of the service of any telephone system to the community. So there is little likelihood that the Independent companies will lose subscribers, but rather a strong probability that the express company will lose business if it does not use the Independent telephones. It remains for the officers of each company to canvass the local situation thoroughly, and, by taking the matter up with stockholders and subscribers who

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patronize the express company extensively, to find out what amount of business normally going to the express company is likely to be diverted to other channels as a result of the absence of the desired communication facilities. Protests from individual shippers, accompanied by fair statements of conditions from the telephone companies, would not be without their due effect on the officers of the express company, who, it is to be expected, are looking out for their own business interests sharply in any arrangement for telephone service which they make.

Even in cases where the subscribers' list of the Independent company is smaller than that of its rival, such a movement would be no less to the advantage of its subscribers, to whom, as a public service corporation, the telephone company owes the duty of furnishing all facilities for doing business over its lines which it can afford to maintain.

The International Association has already taken a firm stand in this matter, and action on the part of all the Independent companies affected needs to be prompt. The officers of the association suggest that those who take up this question should not only forward their statements to Mr. W. L. Fargo, general manager of the American Express Company, 76 Monroe Street, Chicago, but that they also should send copies to the Association, which will continue to follow up the movement. Prompt action is especially desirable in order that the evidence of the necessity for restoring Independent service may be massed, and so make it easy to dispose of this question at an early date.

The Value of a Note Book

A good memory is a treasure much to be desired, but possessed by few. Business men have found how treacherous is the memory when loaded with details. While to a certain extent the engineer must cultivate his memory, he must place his chief reliance on a good note book. Students quickly acquire the note book habit on account of its extended use in college, and know the usefulness of this method of preserving for future use the knowledge which is often acquired with such difficulty. Every man connected with the telephone industry may with profit keep a note book, each according to a plan of which the size and scope meet the needs of his particular field.

The character of a man can often be told from the use which he makes of his spare time. While waiting in a station for a train, or in an office for the arrival of a man, one will often apparently have nothing to do. Sometimes the mind is in such a state that an attractive magazine forms an alluring and helpful relaxation. But more often the time could be more profitably spent in making notes of ideas which are related to business or in studying those already made. It is more than a mere pastime to lessen the tedium of waiting. The information thus preserved may prove valuable, often to a degree that is surprising. This has been the experience of more than one successful telephone man.

"What shall I put in my notebook?" is often asked. Anything that is of interest and likely to be needed in future work should go there. The notebook is a second memory. When something new is encountered it is dangerous to say, "I can remember *that!*" "Put it down" is the only sure maxim. The very act will strengthen the memory, and the writer will be glad some day that he has it written in black and white, showing just how it first impressed him.

No matter what is put in it, there are several ideas as to methods which are helpful in making the notebook what it ought to be. The first is the dating of every entry. With prices of materials and labor this is doubly important, but in all cases the date forms an index to the time when the information was acquired, which may fix its value in relation to other notes. Completeness of the notes, with definite statements of references, sources of information, and similar points of auxiliary value, add much to their utility.

Keeping the notes systematically is another feature which should not be neglected. For this purpose a loose-leaf book is without question the best. In all but a few cases it will not pay to divide the pocket note book into departments for the immediate classification of notes. It is more economical to jot them down, one after another, as they come, usually giving a page to each set of notes. But as the sheets are transferred to a more permanent cover, or binding, they may be separated into groups by special sheets having projecting indexes.

The scheme of classification should not be too elaborate, or it will be difficult to tell where to place certain notes or in what place to look for them when they are needed. Each man can best work up his own classification suiting his business. The following classification has been used by a telephone man with fair satisfaction:

Formulæ; tests, methods of making; tests, results of; circuits, telephone; circuits, telegraph and combined telephone and telegraph; circuits, miscellaneous; miscellaneous, notes from conversations, special troubles; apparatus, data on; construction, aerial and underground; prices; processes; traffic; bibliography (list of references to books and articles).

As the volume of collected notes increases, it sometimes becomes tedious to look through all the pages in a class or group to find what is wanted. Instead of elaborating the classification so as to get smaller groups, it is better to make a simple index. The pages in each group may be most easily found if numbered separately. This feature of ready reference is what is wanted, as the notebook is not a treasure to keep, but a mine, of the owners own making, to be worked diligently. It will furnish funds of information which can be obtained in no other way.

Telephone Conversations as Evidence

The courts are becoming more and more liberal in their rulings upon the admission of telephonic communications as evidence. When the telephone first came into use, communications by its medium were only allowed in evidence when the witness could testify that he recognized the voice of the person talking. Now, however, the courts rule upon mercantile experience and the circumstantial trustworthiness of mercantile custom by which it is found the numbers in the telephone directory do correspond to the stated names and addresses, and the operators do call up the correct number, and the person called does, in fact, answer, that such communications are admissible whether the witness recognized the voice of his communicant or not. The principle set out in the last sentence was recognized by the Maryland Court of Appeals in a recent case in which a contract for ice was claimed to have been made over the telephone (Knickerbocker Ice Company vs. Gardiner Dairy Company, 69 Atl., 405). The witness testified that he called up the Knickerbocker Ice Company, inquired who was there, and was told it was the company. The witness did not recognize the voice of the person talking. The evidence was, nevertheless, admitted.

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The Operating Room Circuit Record

By John Putnam.

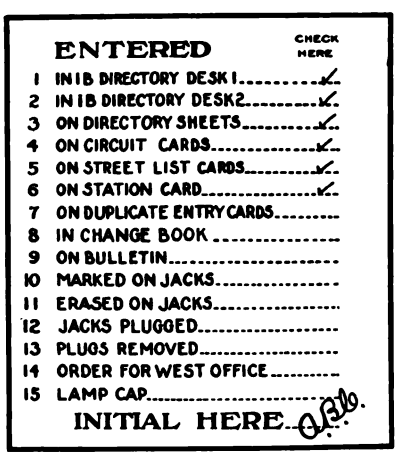
Illustrations from photographs by the author.

The importance of operating room records in telephone management is very likely to be underestimated. This tendency may be due to a variety of reasons. Employees are liable to overestimate the value of those records which are expressed directly in terms of dollars, and neglect those that keep track of the plant and the service. The operating room records are known and handled only by operating room employees, are seldom referred to by other departments or executives, and are never audited. From the point of view of the satisfaction and convenience afforded to the subscriber, however, these records are of the utmost value. They vitally affect that for which he pays, the service. It is doubtful if any records of a telephone company receive such constant reference, or cause more trouble if they are inaccurate. Upon their completeness, accuracy and systematic arrangement depends the efficient handling of a large proportion of the whole traffic of the exchange, and the satisfaction of the customer.

Operating room records should be as few in number as possible; they should not duplicate one another, nor to an unnecessary extent duplicate, or increase, the work of other departments. They should be handled as automatically as human clerks can be trained to care for them, and, above all they must be kept up to the minute. While the various records to be kept depend much upon the size of the office, there are certain records which must be kept in all offices. It may be necessary to elaborate some of them as the size of the office increases, but the fundamental reason for the record remains.

It is proposed in this article to deal with a record that is common to all operating rooms, the "Circuit record," or list of subscribers by lines and call numbers. This record, in small offices, may be kept in the form of a book, but in offices of medium or large size it is usually a card record, contained in one drawer or more as may be required.

In whatever department of a company a telephone employee may be situated, a part of his or her education should be the study of and revising of card index systems. P. T. Barnum


ENTERED CHECK HERE

1 IN IB DIRECTORY DESK 1 ✓
2 IN IB DIRECTORY DESK 2 ✓
3 ON DIRECTORY SHEETS ✓
4 ON CIRCUIT CARDS ✓
5 ON STREET LIST CARDS ✓
6 ON STATION CARD ✓
7 ON DUPLICATE ENTRY CARDS
8 IN CHANGE BOOK
9 ON BULLETIN
10 MARKED ON JACKS
11 ERASED ON JACKS
12 JACKS PLUGGED
13 PLUGS REMOVED
14 ORDER FOR WEST OFFICE
15 LAMP CAP

INITIAL HERE O.J.B.

Fig. 1.—Fac-Simile of Rubber Stamp for Reminding Operating Room Clerks of Things it May be Necessary to do on an Order or Memorandum.

maintained in his lifetime that typewriting and stenography should form a part of every child's education. Card index and loose leaf reviews will be added to these at some time in the future. By a judicious use of one or both of them, almost any business may have its bookkeeping done. When, however, it is necessary to have a card index to find a card in another index, it is evident that the deviser has been so absorbed in detail as to forget the main object of card systems.

After a contract is taken for a telephone, an order to install it is made, in some companies by the exchange manager, in others by the auditor, the system varying considerably in different localities. Orders are also made for changes of service, moving, "take-outs" and disconnections. These orders are made in triplicate or quadruplicate, but as they are not properly an operating form they will not be shown here. Among the copies is one which goes to the chief operator, who assigns a line

Information Bureau Operator Referring to Card List of Subscribers by Circuits.

number, which is given to the wire chief. Upon completion of the work the wire chief signs the order, and sends it to the chief operator, who enters it upon the various records of the operating room, pins his order to the wire chief's order, and returns it to the manager. When the order reaches the chief operator it is stamped in a dating calculagraph, and its back is stamped with a rubber stamp, a fac-simile of which is shown in Fig. 1. As the operating room clerk enters it upon the records she checks off the various items on the stamp, and finally affixes her initials.

Too much emphasis cannot be placed upon the usefulness of this stamp. It is an automatic reminder to the clerk of what should be done. In the example shown it has been checked for the installation of a telephone. It shows that the subscriber's name has been entered in the information bureau directories, on the printer's proof for the directory, on the circuit card, on the list of subscribers by street numbers, and that a station has been added to the proper records. From time to time a few orders may be taken from the files, the items checked upon the stamp noted, the records looked through to see that the entries have been properly made and, if they have not, the clerk whose initials are on the order may be brought up "on the carpet" to explain. It is a great help toward definitely placing responsibility and keeping clerks up to their work.

The cards used in a circuit record in an exchange of 10,000 telephones are shown in Fig. 2. These cards are kept in the drawers of a card cabinet, each drawer having on its front an open escutcheon plate holding a card which designates the numbers contained in the drawer. The record has three divisions: first, the circuits in use; second, those assigned or "to be"; and, third, those available for assignment. The cards are 4 in. by 5 in. in size, and may be printed or bought blank. Standard rulings will do very well for all except the circuit cards. Guide or tab cards may be obtained in salmon, blue or buff color. The projecting tabs at the top may be in sets arranged so that either 5 or 3 run across the width of the drawer, being known as "fifths" or "thirds," respectively. Entries on the circuit cards may best be made in pencil.

Reference to the sample circuit card tells at a glance many

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things about line number 106. It is a party line. No. 1 was changed to 5793-12 on June 24, 1908. Geo. Johnson, at No. 1 Arlington Street is "to be" No. 2. When Johnson's telephone is installed the "to be" is erased. No. 3 was taken out Aug. 19, 1907, and should not be used again for six months or longer, as local practice dictates. Richard Roe is No. 4 at his residence, 3 Arlington Street, and at 48 Berkeley Street, John Brown, No. 5, has been temporarily disconnected while away for the summer. There are being operated a total of three telephones on the wire, as Johnson's hasn't been put in and Brown's is disconnected. To this card should be fastened the duplicate entry, or extra listing card, showing that John A. Smith is in the directory as 106-12, the original listing being Geo. A. Smith. To fasten these, a clip or eyelet that will not pick up the other cards should be used. The duplicate card may be yellow to attract attention. This, however, is not absolutely necessary, as the fastening accomplishes that purpose. Should the reader consider this duplication unimportant, just let him listen to the cards illustrated, position No. 4 has two groups of numbers, consequently a position 4 guide card would appear in front of No. 100 and No. 3680. The latter card would have the numbers arranged like this—3680 to 3739 and 100 to 219, showing that it belonged in front of 3680, as that number came first.

Back of the position card is placed a station card, a simple, small and useful member whose duty it is to give information each month, for the peg count, as to how many business and how many residence stations there are, and how many circuits are in use in each position. This form can be made on a stock card, with pen and ink as stations are added to the position, the number of them is put on the card in pencil, the preceding number at the same time being crossed out. This gives a running record, always up to date, of the number of circuits in use and the number of stations working. It obviates having a separate elaborate record for this purpose, and places the record where it is most convenient to work upon.

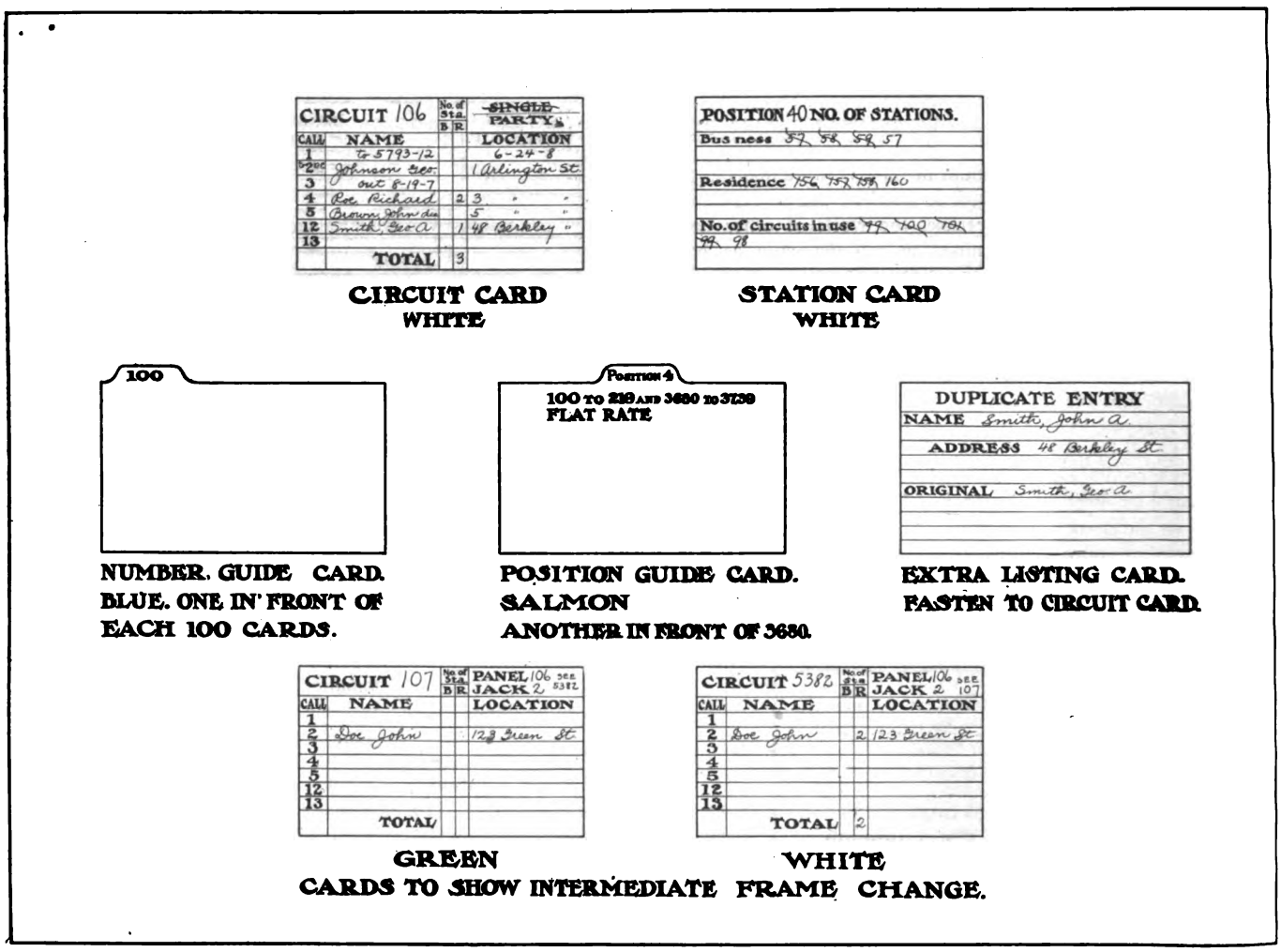

Fig. 2.—Cards Used in Keeping a Circuit Record in an Exchange Having 10,000 Telephones.

John A. Smith when he discovers that the information desk has reported "no 'phone" to a friend who called him from a distant city, this report having been given because a duplicate card had not been made out. In front of each group of 100 circuit cards is a blue guide card, with the number of the succeeding circuit card on the tab. These guides enables one to readily find any card.

In front of the number beginning each position is placed a position guide card, which shows the numbers in each position and whether it handles unlimited, measured or pay station service. This enables one to determine quickly where a line comes in, and is very necessary in offices which have different groups of numbers in the same position, due to answering jacks and lamps having been added from time to time. It will also tell one quickly what kind of service is given on any number. In

The two last cards in the plate are used to show an intermediate frame change. While the writer could not especially recommend this way of keeping such records in an office where there are many and frequent changes of this kind, it serves very well, and obviates the need for a separate record in exchanges having but a few hundred changes. It is particularly effective in handling intermediate frame changes that are made necessary on account of "weeding out" positions; i. e., several positions are found overloaded and a few busy wires are taken from each, and brought in on the answering jacks and line lights of one other position.

A reference to the cards shown will clearly reveal the idea of their use. Circuit No. 107 has a green card in its proper place, green being used only because green lamp caps are used to show these changes, and green is a stock card. Another color

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would serve as well. This green card is a signal to the clerks not to count the stations in that position, but to put them on the card of 5382, whose answering jack No. 107 has been taken to panel 106, jack 2. The green card gives the information operator all the data she wants, and she looks no further. It tells one desiring further information that this wire has an intermediate frame change on it, and refers to 5382. The location of these two cards shows by the position cards that this wire was moved from position 4 to position 40. The clerk counts the stations in position 40, and not in position 4.

In case of an intermediate frame change throwing a whole position or a group of numbers, it is only necessary to shift the position cards. The green cards are not needed. Such a proceeding is not unusual, being frequently rendered necessary by the need of obtaining a position for measured service or pay station work adjacent to positions already handling such service.

The clerks should be given, as demanded, a group or groups of numbers for assignment, these numbers to be carefully chosen by the chief operator after a study of the call counts to determine what positions are underloaded. These numbers may be designated by placing before and after them salmon colored guide cards, upon the first of which may be noted the style of service and the date upon which the numbers were selected. Upon cards whose numbers come in rotation with numbers of auxiliary lines or private branch exchange trunks should be noted "hold for possible auxiliary," one or more being held in accordance with the possible demand.

Many ideas might be incorporated in the circuit record according to local needs, although it would seem that the one

An Operating Room Clerk Working on Record of Subscribers by Circuits.

illustrated had provided for most of the needs of the operating room. To recapitulate, it furnishes the following information:

1. The subscribers by line and call numbers.
2. The subscriber's address.
3. The change of number, outs, and disconnections for six months.
4. Intermediate frame changes.
5. The number of business and residence telephones by positions.
6. The number of circuits in use.
7. The positions on which the lines come in.
8. The assignments of numbers or calls.
9. The duplicate entries, or extra listings.
10. The numbers to be used for assignment.
11. The numbers reserved for auxiliaries or trunks to branch exchanges.
12. The style of service the subscriber has, and whether he is on a single or a party line.

While the card record does very well for this work, the

Card Drawer of Circuit Record. The Numbers of Cards in the Drawer Show on the Front. The Middle Guide Card is the Number Guide, the Card at Left is the Position Guide and the One to the Right, the Station Card.

writer believes that it is not the ideal system. The cards cannot conveniently be fastened in the drawer and are consequently occasionally upset or misplaced. Possibly loose leaf books of the same size in groups of 100 placed side by side in a case of shelves would solve the problem. With such a scheme the clerks could lock the cards in the binders, and if one card was taken from the record, a hundred would go with it, precluding the possibility of loss or misplacement.

More Specific than Service Tests

As a statement concerning telephone service which "gets there" and conveys the desired impression with vigor and distinctness, we commend to our readers the following from the *Herald*, El Paso, Tex.: Cloudcroft, N. M., June 25.—The long distance "telephone" line between this place and El Paso is an abomination and the cause of more profanity than any other one thing in the Southwest—unless there is another line like it in these parts.

The principal purpose of the line seems to be to make men swear and women hysterical. About the only purpose it serves is to prove that "central" at Alamogordo is an angel, or she could never be so sweet tempered in the midst of so much ill temper on the part of others.

While you are ringing and worrying and breaking that particular commandment which forbids the utterance of words profane, central maintains the same accommodatingly sweet voice and keeps calling into your ear, "Hello, Cloudcroft, here's El Paso. Please keep off the line, Artesia; it's busy now. Hello, El Paso; here's Cloudcroft. Oh, you can't hear El Paso. Please speak a little louder, El Paso. Say, Cloudcroft, can't I repeat for you? Tularosa, the line is busy. No, Artesia, we are still talking. Hello, Cloudcroft; I'll help you to talk to El Paso. What is——"

But Cloudcroft, or at least the frantic individual at Cloudcroft who has had an important message for El Paso, which he has been trying to get in over the telephone and which he knew in advance—owing to past experiences—would be a failure, is by this time swearing over the hill in the direction of the depot to file his message with the operator and get it through the same day—if the wires are not too full of birds.

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Equipping the Rural Telephone Lines

By G. A. Joy and J. B. Theiss.

The various circuits employing the grounding key solve the question of silent signaling very nicely where metallic lines are in use, but it is quite evident that this scheme cannot be utilized on a ground return system. In exchanges of this class the desired results are accomplished by equipping the instruments with hand generators capable of generating either pulsating or alternating current, and a key so wired as to enable the subscriber at will to switch either the one or the other out on the line. The pulsating current is used in signaling the exchange, and the alternating current for calling the various subscribers on the line by means of the usual coded ring. With this arrangement one subscriber, upon signaling another, will "throw" the drop at the switchboard. The operator can very readily distinguish a code ring from a regular call, and in the case of a ring for a party on the same line, will simply restore the drop and not plug in on the line at all. To aid the operator in distinguishing the coded signals it is common practice to terminate a line of the kind just described in a combined ringer and drop. The one inherent disadvantage of the combined ringer and drop is that it takes up more of the available switchboard space than the ordinary drop does. However, as an operator is not able to care for as many rural lines as regular subscribers' lines, it will be found that with the standard type of switchboard there is sufficient room for all the equipment that an operator can properly handle.

In Fig. 3 are shown the circuits of the telephone instruments and the switchboard end of the line for a system such as has just been described. It will be noted by referring to this circuit that all the subscriber has to do to call central is to turn the generator crank. This operation puts pulsating current on the line, and thus energizes the coil of the drop, thereby actuating its armature and releasing the shutter. Since the pulsating current flows in but one direction, it will not affect the bells of the subscribers' instruments, as this current tends to pull the bell armature in but one direction. However, should the armature of the bell be in a neutral, or such other position so as to cause the pulsating current upon traversing the coils of the ringer to attract its armature in one direction or the other, then the bell would give one stroke, which might be sufficient in many cases to attract the attention of some gossip-loving person. To avoid this condition a light biasing spring may be placed on the ringer, to hold the armature in its proper position.

When a subscriber desires to call a party on the same line he will depress the key *K* and ring, thereby ringing the various bells on the line as well as actuating the drop at the exchange. It is understood, of course, that the scheme just described is applicable to a metallic as well as a grounded line, but that it is not quite as desirable as the grounding key system for the former, since the subscribers cannot signal between parties on the line without attracting the attention of the operator, and so tending to reduce the number of rural lines an operator can handle.

By referring to the circuits thus far shown and described it will be noted that a condenser has been placed in the receiver circuit of all the subscribers' sets. Nothing has been said thus far concerning the use of this condenser, and as we are about to describe a system in which the condenser in the subscriber's set is used for an entirely different purpose it seems advisable to cite the functions of the former condenser before advancing into this new system. The condenser as shown is not needed for the satisfactory operation of the telephone, but is simply inserted in the circuit to guard against trouble. Thus, it is not uncommon for a subscriber on one of these rural lines to forget to hang up his receiver, or possibly some inquisitive person might have his receiver to his ear waiting for any news that might chance to come his way. With conditions established as just cited it would be impossible for the operator to ring any of the subscribers on the line if the condensers were omitted, as the low resistance of the receiver would shunt the greater part of the generator current and thus rob the ringers of the necessary current to actuate the tapper. However, with the condenser in circuit conditions are quite different. The condenser acts as a high resistance to the low frequency ringing current and thus forces it through the ringer coils. Consequently, in case any subscriber carelessly neglects to hang up his receiver he will not tie up the entire line, as the operator is

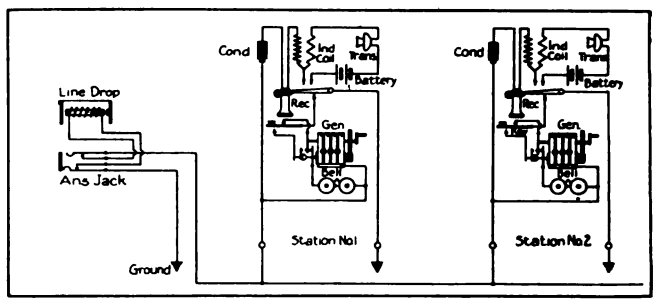

Fig. 3.—Circuit Showing the Use of the Pulsating and Alternating Current Generator in Subscribers' Sets.

in a position to signal any party desired. While this condenser acts as a very high resistance to low frequency currents, the resistance offered to the high frequency voice currents is inappreciable. The condensers used for this purpose are of low capacity, ranging from 3/5 to 1/2 microfarad. Experience leads practically all managers who have tried it to the opinion that the use of this condenser as indicated is very beneficial. Even though the initial expense of the set is slightly increased, its adoption will more than pay for itself, as it will save the lineman many a trip into the country, and so will naturally reduce the cost of maintenance.

(To be continued.)

The Influence of Operators on Collections*

By Miss Rosa Gist.

Local operators do not always realize that they may help or hinder in the collection of telephone bills.

They help by answering calls promptly; being pleasant to the public generally; avoiding disconnections; re-establishing interrupted connections when possible without irritating subscribers; when a telephone has been rung through error, by waiting to explain to subscriber that the ringing was a mistake instead of plugging out and leaving some other girl to bear the brunt of the subscriber's temper if he answers a call which he terms a "false alarm." A large percentage of our complaints on rental bills is caused by incorrect ringing and disconnections.

While, to the local operator, each item mentioned may seem a small thing, yet quite a lot of valuable time of the collectors is taken up in listening to complaints caused by failure to prevent the occurrence of small things.

Toll operators' first aid in collections comes in the proper recording of tickets. About 75 per cent of our disputed calls are those for which claims are made that they should have been paid at the other end. By always asking a subscriber if he will pay for a message or if he wishes it paid at the terminating station and by getting the proper O. K. on all reversed calls, the number of disputed bills ought to be reduced.

Another aid to collections would result from a complete record of toll service. If service is satisfactory this may be indicated on the back of the ticket by the letters "O. K." If

*Abstract of a paper read at a meeting of a section of the Pioneer Boosters' Club, McAlester, Oklahoma.

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trouble is experienced it may be described briefly on the back of the ticket, so that future reference will not involve a hunt for the operator who had the connection to get a statement as to the service. When any special trouble is experienced, the operator who is really interested in her work will think about the effect this trouble will have on the collection of the bill for the call.

It is especially helpful to have a record of service where the tickets are timed by the chief operator, as she naturally times tickets for the full amount shown by the calculagraph if she knows nothing of trouble having been experienced.

One cause of complaints which are used in arguments for a reduction of bills results from the operator's going in on connections without waiting to find out whether conversation is in progress before speaking. Another cause is failure to stamp tickets correctly. Even the best of operators are sometimes late in stamping tickets. Instead of putting the ticket away to be checked full time, an allowance should be made, and the call only checked for the actual length of conversation as nearly as this can be judged.

Letter from a Successful Telephone Manager

A visitor to the exchange of the Red Wing Telephone Company, of Red Wing, Minn., describes it as a model, showing what success may come from applying good business methods. In response to an invitation to tell something of the plans put in force and their results, Mr. D. M. Neill, secretary and treasurer of the company, writes as follows:

"Whatever of merit our system of management possesses is the outgrowth of study and a desire to serve the public as it should be served, and give to it a proper return for its money.

"In the first place we firmly believe the public would appreciate and respond in kind to such treatment, and in this we have in no wise been disappointed, as our growth from nothing to 1400 subscribers in three years, in a city of nine thousand people, amply testifies; and this was in the face of the most bitter opposition, falsifying and price cutting carried on by our competitor. No exchange ever started under more adverse circumstances than that of the Red Wing Telephone Company, but it has been thoroughly successful, financially, in growth in number of subscribers and in popularity with the public.

"We believed there was one way to win and only one, viz., *the giving of continuous first-class service,* something that our opposition had never tried, and never given. To secure that end all our construction was first-class, from the underground conduit work to the metallic circuit rural lines. To show how well and carefully it was done, we have only to state that we have never had occasion to touch our underground cable since it was connected up, and the same is true of our overhead cable, except where it has been accidentally injured. Everything about the switchboard and terminals was the best that could be bought, and every care was taken in the installation to have it perfect if possible.

"The exchange is located in the finest building in the very heart of the town, is finished in mahogany, with tile floors in office, lobby and operating room, lighted with gas and electricity, has separate rest and toilet rooms for operators, and everything possible is done for the health, comfort and well-being of the working force of the exchange.

"Every one connected with this exchange is taught that the end and aim of his or her connection with the company is *Good Service;* that whether subscribers are rich or poor, pleasant or cranky, courteous or 'chronic kickers,' they are entitled to good service. Having rendered this, the operators are assured that they will be protected against imposition and abuse from unreasonable and overbearing subscribers. On more than one occasion telephones of subscribers have been removed for discourtesy to and abuse of operators, and these are not reinstalled until proper apology has been made. However, the great majority of the public appreciate and reciprocate good treatment; here, as elsewhere, courtesy yields the largest returns.

"After the spirit of 'good service' is thoroughly imbibed by the working force the rest seems easy. Each department vies with all the others to make it 'better service,' and all details are watched with the utmost care. Instead of being harshly reprimanded, operators are encouraged to report all cases of complaint, whether against themselves or others, and the proper remedy is at once sought and applied. This removes all desire for, or imputation of, 'tattling' among employees, and brings every case of trouble with all possible detail to light at once, so that it can be remedied with the least possible friction and loss of time.

"To encourage loyalty and faithfulness all employees are given a stipulated amount for each new subscriber they bring in, whose contract is accepted by the company. Every employee thus becomes a solicitor and none others are employed. By these means the employees are constantly impressed with the value of 'Good Service,' as quality and amount of service is our basis for soliciting new patronage. After making our price for service at what we believed to be a fair rate, we have never varied from it, even when our opposition was giving free service. Nor have we ever permitted the rate question to be a factor in soliciting subscribers.

"Our rural lines are all metallic circuits, with push buttons on the telephones for calling central.

"We transmit the Government weather report to all our rural subscribers between 9 and 10 a. m. each week-day, and immediately after 6 p. m. we send them the market reports and a summary of the news of the day. This summary is made up by the chief operator upon receipt of the local daily paper, usually between 4:30 and 6 p. m., and consists first of important world news; second, United States news; third, State news, and lastly, local news of interest to rural subscribers. In addition to this we send out very important news items at any time during the day or evenings; chase horse thieves, sell produce and make ourselves generally useful.

"It is impossible in a letter of this length to enter into details. We have tried to give a brief outline of our methods; they have been very successful in our case, and we believe they will be equally so with others. There is no patent or copyright on them and all are free to use them. If we can aid in the general uplift we are glad to add our mite to the great store of human knowledge, for even 'out of the mouths of babes cometh wisdom.'"

Railway Men Recognizing the Importance of Forest Preservation

The recent action by the board of directors of the American Railway Engineering and Maintenance of Way Association, in appointing a committee of seventeen to investigate and report upon the subject of wood preservation has shown that the practical railroad men of the country recognize the importance of taking steps to conserve the rapidly diminishing timber supply of the United States.

Timber is one of the principal materials purchased by the railroads, and its economical use is a subject of far-reaching importance. More than 100,000,000 cross-ties are used annually by the different railroad companies, and their average life in this country is not more than six or seven years. From a study of European methods, and the knowledge of wood preservation under conditions in this country, timber-testing engineers say it is reasonably certain that an average life of from 15 to 20 years may be secured by treating the tie with a good preservative and the use of improved devices for the prevention of mechanical abrasion, thus to a large degree diminishing the drain upon the timber supply.

While the quantity of timber used for ties is very great, and the problem of a future supply is a serious one, yet this class of timber is not the only one which should receive consideration. A greater length of service from timber now used by railroads for bridges, trestles, piles, fences, and transmission poles is greatly to be desired.

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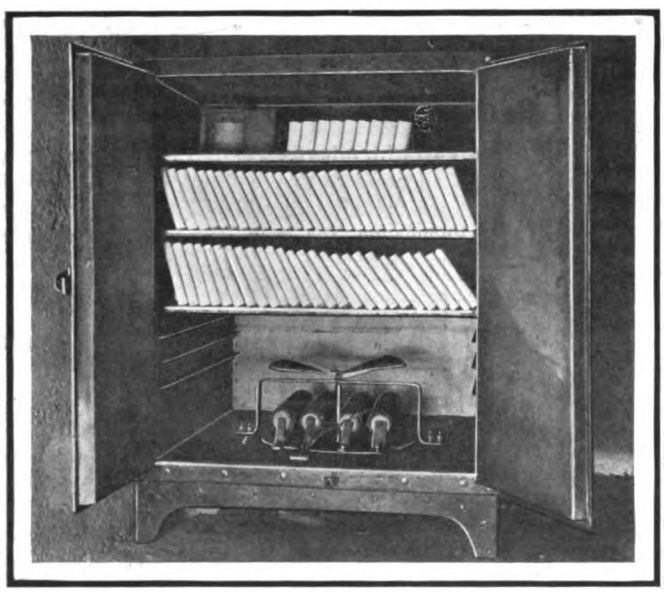
The Manufacture of Electrical Condensers*

By G. F. Mansbridge.

The necessity for having mandrels of different diameters arises from the fact that variously shaped condensers are demanded; obviously plates of any desired capacity can be made on any one mandrel by merely varying the number of turns. From first principles it would be expected that the capacity of a condenser would be directly proportional to the area of the electrodes, but in practice it is found that, within limits, plates of high capacity require appreciably less area per microfarad than those of low capacity. This is particularly the case where the thickness of the plate is small in comparison with its length and breadth. There is therefore a saving in material as well as in labor by building the plates in as large units as possible. Further, it is found that plates built with narrow foiled paper require less material per microfarad than those built with wide paper, the treatment and material being otherwise identical throughout. This effect is doubtless due to the wider paper offering greater facilities for trapping the paraffin instead of allowing it to be expressed. The two effects taken together indicate that a condenser in the form of a cube would require less material than one in any other shape. The cube is, however, not the most suitable shape for manufacture, and as the conditions of service are often such as to demand the adoption of thin, flat plates, the usual compromise has resulted. The capacity most in demand for telephone work is 2 microfarads, and as plates of this size form a convenient manufacturing



Drying Oven, Electrically Heated and Fitted with Fan.

unit, they are usually taken as the basis on which to frame standard data for manufacturing purposes. Condensers of larger capacity are almost invariably built up by assembling standard units, rather than by direct manufacture in large plates. The usual sizes of paper at present in use are: for interleaving paper, 7⅛ in. or 4 in. wide by ½ mil thick, giving about 400 sq. ft. to the pound; for foiled paper, 6⅜ in. or 3½ in. wide by 1¼ mils thick, giving 100 sq. ft. of conducting surface to the pound, and consisting of 35 per cent tin and 65 per cent paper.

At one time an unfoiled margin was left on each side of the foiled strip, but since the introduction of the "breakdown process" subsequently referred to, this has been found unnecessary. The substance of the paper is gaged on a 10-fold thickness by means of the usual screw micrometer, as specially made with large contact surfaces for paper gaging. With 1¼-mil foiled paper and ½-mil interleaving paper, the area required for a 2-microfarad plate is about 12½ sq. ft. for each electrode. The volume of the plate after waxing and pressing is approximately 7½ cu. in., and the weight 7 oz. The insulation between the electrodes taken at 60 deg. Fahr. with 400 volts after one minute's electrification, usually lies between 1000 and 2000 megohms per microfarad.[1] Any lower insulation than 1000 megohms per microfarad is an indication of imperfect desiccation, excessive pressure, or faulty material.

It should be noted that the specific insulation (resistivity) of foiled paper is lower than that of plain paper, the difference being due chiefly to the fact that the former is heavily sized. It is, however, only for special purposes that condensers of extremely high insulation are demanded. In such cases, by using the utmost care and material of the very highest quality, it is possible to obtain an insulation of nearly 20,000 megohms per microfarad (400 volts, 60 deg. Fahr., 60 seconds). Such condensers are invariably built up of sheets rather than by the rolling process, since it is necessary to use only perfect sheets, and the rolls of paper cannot readily be examined; under these conditions metallic foil may be used in preference to foiled paper. Three sheets of paper are usually interleaved between consecutive foils. The obvious, but often overlooked, fact may here be commented upon that increasing the number of interleaving papers, while increasing the actual insulation of the plate, does not increase the "megohms per microfarad" since the capacity falls in proportion to the rise of insulation, provided, of course, that there is no abnormal leakage through definite faults.

For certain purposes, such as absorbing the spark across the break of sparking coils, leaky condensers, that is, condensers with specially low insulation, are of advantage, since the high-resistance shunt afforded by the low insulation across the break materially assists in suppressing the primary spark and in thereby lessening the pitting of the contacts. The low insulation necessary may conveniently be obtained by rolling up foiled paper without any interleaving paper, the plate being in other respects treated in the ordinary way. The insulation obtainable will depend partly on the thickness of the foiled paper and partly on the intensity of pressing, but will usually be of the order of a megohm. An important detail in the manufacture of condensers for spark suppression is that there must be no appreciable resistance in the condenser circuit, that is, in the electrodes or thin connections. The insertion of even 1 ohm in series with the condenser of a high-frequency spark coil markedly increases the sparking at the primary contacts.

The value of the advance made by the introduction of foiled paper for condenser making lies in the fact that in this material the dielectric and the conductors are more correctly proportioned to their work than is possible when solid metal foil is used. Owing, therefore, to what may be called the better design of the foiled-paper condensers, it is correspondingly cheaper, lighter and smaller. Even with foiled paper, although the quantity of metal per unit area is extremely small, the conductance of the electrodes is in excess of the actual requirements, while if solid foil is employed, it is necessary to use fully 10 times the weight and volume of metal that would suffice if only the conductance had to be considered. The necessity arises from the fact that metal foil cannot be rolled in continuous lengths to give a greater covering surface than about 90 sq. ft. per pound (about 18½ sq. m. per kilogram), and even with this thickness the foil is extremely tender and requires delicate handling.

*Abstract from paper presented at a meeting of the Institution of Electrical Engineers, Great Britain; concluded.

[1] The expression "megohms per microfarad," though incorrect, is so generally employed that the custom has been followed throughout this paper; the phrase should, however, invariably be interpreted as "megohm-microfarads."

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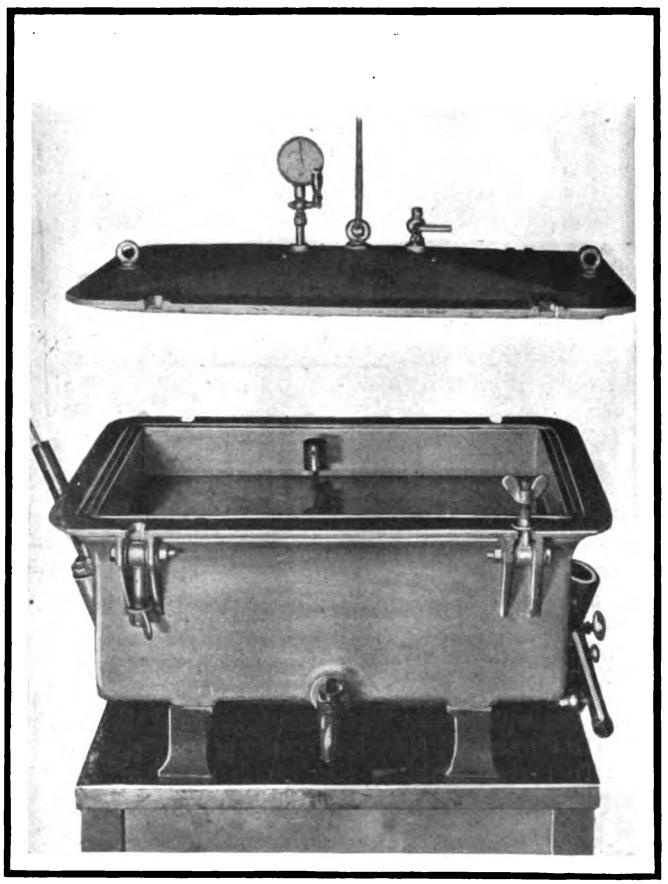
as, if made of pure tin, it is only 0.0003 in. thick. The metal foil is in addition expensive, and is by far the most costly item in the construction of a condenser. Further, when metallic foil is used, short-circuits are very apt to develop both during manufacture and in subsequent use. The short-circuits are due to grit in the foil, or to pinholes, or other defects in the interleaving paper, or are consequent upon disruptive discharges caused by the application of a voltage in excess of the dielectric strength.

Now with respect to these short-circuits or disruptive discharges, however produced, condensers made of foiled paper have the peculiar advantage of possessing to an almost perfect degree the property which in a pneumatic tire is called self-sealing, and consequently they are practically proof against short circuit, and can be subjected to much higher voltages than is permissible with those made from metallic foil, any momentary short-circuits produced by a disruptive discharge being instantly and automatically sealed. This automatic sealing is brought about in the following way: Owing to the extreme thinness of the conducting film the small quantity of heat generated at the point of short-circuit by the sudden discharge of the condenser through that point is sufficient to cause the film of metal immediately surrounding the point of breakdown to be fused into minute globules. The segregation of these globules from each other and from the surrounding metallized surfaces effectually isolates the point of breakdown, and the defect is instantaneously sealed up. So rapid, indeed, is this effect, that if a pin is stuck into an insulated charged condenser so as to produce short-circuits between the foiled papers, the short-circuits seal up without fully discharging the condenser, and a dozen or more of such short-circuits may be created one after the other before the condenser becomes fully discharged. Consequent upon the observation of such an effect as this, the author conceived the idea of electrically treating the foiled paper before making it up into condensers in such a way as practically to eliminate all pinholes or defective places by subjecting them momentarily to currents of such strength as to produce a minute non-conducting ring round each defect, thereby isolating it from the surrounding surface. The apparatus for doing this is of the simplest character. All that is necessary is to pass the paper, boiled side uppermost, over a conducting roller, and to maintain a suitable potential difference between the roller and the foiled surface.

Joints in the paper may have to be made from time to time. These must, of course, be made electrically continuous, and a simple way of effecting this is, after the ends have been joined by lapping and pasting in the ordinary way, to paste on to the foiled surface a 6-in. strip of foiled paper placed face downward, so that part of the foiled surface of the strip makes contact with one side of the break and part with the other. It is not desirable to paste the whole of the surface of the strip since the continuity of the film may thereby be destroyed; the usual plan is to paste merely the edges on each side leaving the middle portion clean. Good flour paste is found to give satisfactory results.

The condenser plates having been wound then pass to the drying oven, and subsequently to the vacuum pans and screw-presses. The desiccation of the plates prior to waxing must be very complete and thorough if the highest insulation is required. Ovens heated by gas, steam and electricity are in use for this purpose, but the last-named is infinitely preferable. The ease with which the temperature can be controlled, and particularly the facility with which the heat can be kept to its legitimate purpose instead of being dissipated throughout the shop, and the absence of objectionable fumes and of steam joints, which always give trouble sooner or later, are advantages sufficient to place this form of oven easily first. For an oven of about 25 cu. ft. capacity which will accommodate 500 2-microfarad plates, a power consumption of 2 kw suffices. The length of time necessary to produce thorough desiccation depends upon the temperature of drying, the relative dryness of the air and the degree of contact between the hot air and the paper. The temperature permissible is limited by the necessity to avoid scorching the paper, since cellulose suffers adverse physical changes if heated much above 212 deg. Fahr. for any considerable time. Consequently the practice at one time was to dry the condensers at a temperature of 212 to 220 deg. Fahr., but this involved from three to four days stoving unless the plates were composed of only a very few sheets or layers, and were disposed in such a way that the heat could readily permeate, and the moisture readily leave, the innermost layers This in commercial work is impracticable since some condensers of ordinary size have over 100 convolutions; that is, 800 layers of paper in the flat roll and a great many have to be accommodated in the oven at the same time. In seeking for means to introduce heat into the interior of the condenser, and thereby to expedite the drying process, the author tried the plan of utilizing the resistance of the strip of foiled paper to generate heat in the interior of the condenser when a current of suitable strength was passed along it. To this end all that was necessary was temporarily to short-circuit the plate by means of the connecting lugs at the commencement of the roll, and to pass the current in at another pair of lugs at the end of the roll. It was found in this way, that with an oven temperature of 212 deg. Fahr. and an additional expenditure of 4 watts per 2 microfarad plate, thorough desiccation could be effected in 8 to 12 hours, without any scorching of the paper, although the temperature inside the rolled condenser reached 270 deg. Fahr. Although fairly simple in manipulation, this method did not lend itself very readily to commercial manufacture on the large scale, but it served to point the way to the possibility of using higher temperatures without scorching and it eventually led to the use of a simple process which has been found most satisfactory and efficient, namely, the vigorous churning of the heated air inside the oven by means of a fan. This rapid circulation results in a great number of particles of heated air being brought into contact with the paper in a given time, and as a result of numerous trials it is found that the use of a fan in this way permits of temperatures as high as 290 deg. or 300 deg. Fahr. being employed without scorching



Vacuum Pan for Impregnating the Condenser Plates with Paraffin.

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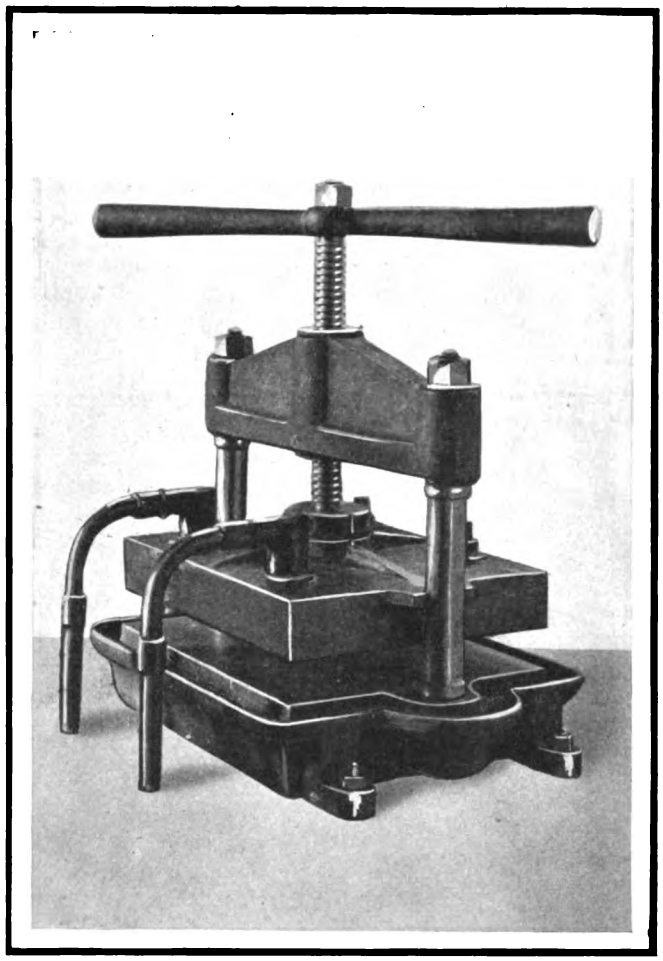
the paper. It will be understood that the fan does not create a circulation of air from outside, but merely churns the hot air in the oven, and although after a time this air becomes more or less moisture-laden, the high temperature enables it to absorb an enormous weight of water before reaching saturation point. By running up the temperature in this way satisfactory



Water Cooled Press for Shaping and Pressing Out Excess Paraffin.

desiccation can be obtained in as short a time as eight hours, and this quick drying is of very great advantage.

After being effectively desiccated the plates have to be impregnated with paraffin wax. The function of the paraffin is:

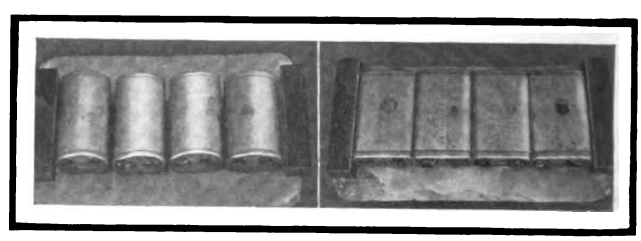
1. To increase the inductive capacity of the dielectric.

2. To prevent moisture from again reaching the highly hygroscopic paper.

3. To retain the condenser in the closely compacted form into which it is compressed while the wax is hot.

The inductive capacity of the layers of paper and air which separate the electrodes before the plate is impregnated is approximately 1.2, and on the air being replaced by paraffin this increases to approximately 3.2. Obviously the more thoroughly the air is replaced by the paraffin the greater will be the gain and to facilitate this it is advantageous to impregnate the condensers *in vacuo*. Hot wax very readily penetrates paper, and it might be thought that soaking for several hours in paraffin at 212 deg. Fahr. would suffice thoroughly to impregnate the paper, but as the result of tests of some batches aggregating a thousand plates it was found that the gain in capacity due to impregnation under vacuum averaged 11 per cent. This means that by using the vacuum process 11 per cent less material is required for a given capacity, while in addition the condenser produced is more reliable, since every isolated air bubble entangled in the interior tends to reduce the dielectric strength by causing unequal distribution of strain, and also tends, by expansion and contraction, to cause, in time, a drop in capacity by separating the layers, and a drop in insulation by affording an opportunity for moisture to enter the interior of the plate.

An obvious way of impregnating *in vacuo* is to exhaust the air from the pan containing the condensers, and then after complete evacuation to run in the hot paraffin; but equally good results can be obtained by simple exhaustion over the wax, that is to say, by plunging the plates into a pan of hot wax, fastening the lid, and then maintaining a vacuum in the upper portion of the pan. The advantage of the latter plan is as follows: In order to facilitate the exhaustion it is necessary to heat the paper; this heat can most conveniently be conveyed into the inside layers of paper by means of the hot wax. If the exhaustion is carried out with the paper dry there is no vehicle to carry the heat into the interior of the condensers and only radiated heat from the sides of the pan is effective since the air has been withdrawn; for other reasons also the plan of evacuating over the wax is found to have the balance of advantage. The method of pressing and the manipulation at this stage are of considerable importance, and it may, therefore, be well to describe this operation in detail. In the first place, it will be obvious that the greater the pressure the greater, within limits, will be the capacity obtained, and with this object it is the practice in certain factories to employ hydraulic machinery and to compress the plates to the utmost limit. The objections to this course are, however, considerable. First, there is a great tendency to drive the paraffin out of the pores of the paper and so to leave the paper readily penetrable by moisture, unless the plates are at once hermetically sealed. Secondly, the enormous pressure greatly increases the liability to short-circuits, and although this is of little importance with foiled-paper condensers owing to the automatic sealing, it is better to avoid it since such breakdowns after the paper has been waxed are always accompanied by a fall in insulation. Thirdly, the excessive pressure results in lowering the insulation to an extent which is out of proportion to the increased capacity. This effect necessarily follows from the reduction in the proportion of paraffin to paper, since the wax has much the higher specific insulation. A further objection to hydraulic pressing is that for commercial reasons it involves the simultaneous pressing of a vertical pile of plates, and this procedure is to be deprecated since the cooling of such a pile is necessarily slow, and the wax continues to drain out of the inner condensers to such an extent that when cold there is comparatively little left in them. As the result of experience, it can be said that for a condenser which is required to maintain its insulation and capacity for many years it is of first importance that a good body of wax be left in the plate. For this reason the pressing of even two plates one above the other is not permitted at the Post Office factory. The same objections do not, of course, apply to the pressing of a number of plates side by side; indeed, this is the current practice and is found to give satisfactory results. With the same object—namely, that of retaining a sufficiency of wax in the plate, the presses are water-cooled both on the top and on the bottom. This water-cooling, in addition to the technical advantage referred to, has also the commercial advantage of increasing the output



Impregnated Condenser Plates Before and After Pressing.

of the presses, which is of importance now that condenser manufacture is carried out on such a large scale. With cooling water at a temperature not exceeding 60 deg. Fahr. five minutes' cooling in the press suffices for a condenser ¼ in. thick; for plates of greater thickness a correspondingly longer time is necessary. The presses are of the screw type, and the question naturally arises as to why this form is adopted in preference to the apparently more scientific method of a lever

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and dead weights. Contrary to what might be expected, experience shows that more uniform results can be obtained with screw presses than with levers and dead weights, and the latter form has consequently been altogether abandoned at the Post Office factory. Even the use of gage blocks for the screw presses, by means of which the condensers are pressed to a certain definite thickness, seems to give less uniform results than can be obtained by a careful workman with a little practice, without any guide other than the "feel" of the press, and an occasional capacity test of the plates as they come from the presses. One objection to the gage blocks is that they do not allow for the small commercial variations which are constantly met with in condenser manufacture, and another is that they tend to reduce the operation of pressing, which is one that really requires some little skill and care, to the mere manipulation of a machine.

As soon as the plates are fairly cold they should be placed aside to settle down in temperature before being tested, and in the meantime they should be protected from atmospheric moisture. Paraffin, contrary to the opinion of the layman, is markedly hygroscopic, and it is important that the outer layer of wax should not be allowed to absorb moisture before the condenser is hermetically sealed; otherwise the insulation will steadily fall, as the moisture diffuses throughout the mass.

A Vibration Eliminator

By John Belden.

Ringing current for a small magneto telephone exchange with which the writer was once connected was supplied by a generator of the bar-magnet type, driven by a belt from a small 220-volt direct-current motor. This equipment was mounted on a shelf in a room adjoining that in which the switchboard was installed. The exchange building was a frame structure, old and none too solid, and the vibration caused by the operation of this machinery was taken up by the partitions, walls and floors, and thence communicated to the switchboard framework. The continual rattle was very annoying and frequently was the source of considerable trouble, as the noise would be taken up by the operators' transmitters and the side tone rendered conversations over long lines very difficult.

An effort was made to correct the trouble by moving the set to another part of the building, but although the noise was considerably lessened by this expedient, it was not altogether eliminated. Fig. 1 shows how a remedy was finally applied. The combination of motor and generator was mounted on a platform and suspended from the ceiling by wires, cushioning springs being interposed between the platform and the suspending wires at each of the four corners. The drawing, a side

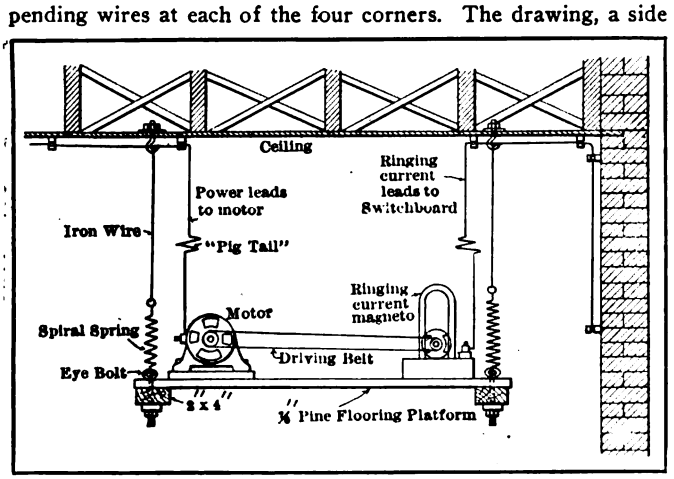

Fig. 1.—Arrangement for Eliminating Noise Caused by Vibration.

elevation, shows the whole arrangement clearly. The platform was made of ⅞-in. tongue and grooved matched flooring screwed to 2-in. x 4 -in. cleats. Substantial screw hooks, from which the suspension wires hung, were let into the wooden ceiling over the proposed location of the platform, one for each of the four corners. The suspending wires were No. 10 B. W. G. galvanized iron, and the four steel springs were taken from an old iron bed spring (see Fig. 2). They were of about No. 7 B. W. G. steel wire, close wound (that is, each turn, when there was no tension on the spring, lay against those on either side of it) and were about 8 in. long. The external diameter of each spring was about 1 in. Fig. 2 shows a detail

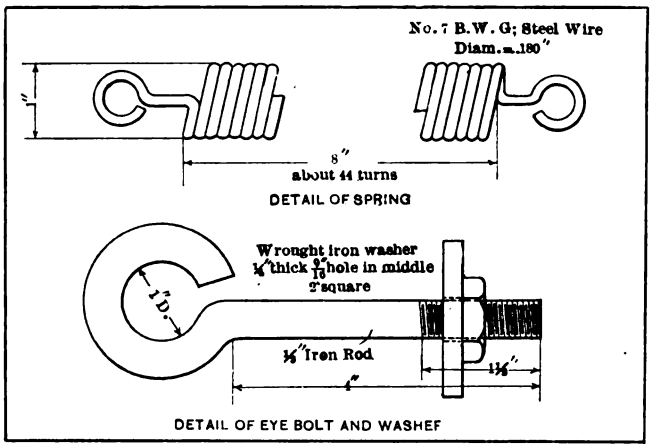

Fig. 2.—Details of Spring and Eyebolt.

of the spring and of the eyebolt. Such a spring will safely carry 100 lb., and with that load it would extend about 1½ in. As four springs would carry $4 \times 100 = 400$ lb., much more than the combined weight of motor, generator and platform, the arrangement was amply safe. Where such a spring is desired one can be easily made by winding steel wire of the required size around an iron rod and bending the eyes as shown. The construction of the eyebolt and washer is obvious from the illustration in Fig. 2.

Leads to carry power to the motor and to conduct ringing current from the generator were supported overhead on knobs, and thence brought down at the proper points. In each lead, between the point of attachment at the ceiling and the machine binding post, several turns or "pig tails" were made to take care of any vibration, providing against the breakage of wire at the binding posts.

The device was eminently satisfactory. After its installation there was no further complaint of "vibration noise." The springs did what was expected and absorbed the vibration.

It goes without saying that the most appropriate way to take care of the trouble would have been to have installed a self-contained motor-generator set, having both machines, generator and motor, mounted on the same cast-iron base plate. A first-class set of this type runs with practically no vibration. But such an expenditure was out of the question—hence the adoption of the method described, which may be useful in other exchanges where similar conditions prevail.

Wants to Find Out Who Pays the Damages

Several weeks ago Mr. Elmer Myers, of Bippus, Ind., was out driving and his horse was severely injured by running into a telephone wire lying across the road. Mr. Myers has not been able to use the horse since the accident and is asking the Bippus Telephone Company to pay him the value of the horse, the doctor bill, the cost of feeding since the accident and the loss entailed by not being able to use the horse.

The telephone company has decided to let the matter be carried into the courts as there is a question as to the ownership of the line which was down. It appears that one of the stockholders in the Bippus Telephone Company at the time of consolidation with the Luther Telephone Company wished to have that portion of the line reserved as his part and has since had the use of the telephone at half price as his share of the profits. There was no written agreement, but the telephone company has never done any work on the line and was not notified of the wire being down. Mr. Myers claims that there are two subscribers on the line and hence it does not belong to the stockholder. The case has aroused considerable interest in Bippus.

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Consolidation of Competing Companies in Pennsylvania

Is there any statutory barrier to the consolidation of two companies in this county. Separately neither has a very long line, but together the territory covered would be enough to make the business profitable.

If the companies are not competing, there is no statutory obstacle to consolidation, but the consolidation of competing companies is prohibited in the State. See Pepper & Lewis' Digest.

Maryland's Telephone Rate Statute

We understand that the State of Maryland authorizes a patron of a telephone company to require the company to enter into as favorable a contract with him as it has with any other subscriber of the concern. Will you kindly advise us what the terms and requirements of this law are?

The statutes of the State of Maryland prescribe the maximum rate to be charged for telephone service, and then state that anyone may make a special contract, before service is supplied, at any rate and on any terms he chooses. Every special agreement made in any year is stated to be a form of contract into which every other person shall have a right to enter in such year. But this is not to impair the obligation of the company to furnish telephones at the rates mentioned. Public General Laws of Md., 1907, Art. 23, Sec. 328.

Abatement of Telephone Pole as a Nuisance

In an action by the Maryland Telephone & Telegraph Company against Samuel H. Ruth, the Maryland Court of Appeals has sustained the right of a property owner to cut down a pole unlawfully erected in front of his property, if he does so in a peaceful manner. Ruth owned a leasehold estate, renewal forever, subject to a redeemable ground rent created by a lease, in their residence in Baltimore City. In the rear of the lot was a 10-ft. private alley to the use of which it was entitled by the terms of the lease. The rear end of the lot was described as "running southerly on the east side of said alley." In February, 1906, the telephone company asked permission to erect a pole in the alley back of the lot, but this permission was refused. Nevertheless the company, in the absence of Ruth and his wife, erected a pole in the alley and subsequently attached cross arms to it and strung wires thereon. When Ruth found the pole there, he at once applied, through his counsel, to the company to remove it and threatened to sue for an injunction. The company paid no attention to his notice, and he applied for an injunction, the company denying his right to relief. His counsel then wrote the company that he intended to abandon his equity proceedings, and remove the pole himself unless the company promptly took it away. Still getting no attention from the company, Ruth had the pole cut down in a careful manner, the wires being cut by an expert and tied up so that they would not hurt any one, and the pole lowered under the direction of his counsel. In taking down the pole a transformer mounted thereon was not removed, and when the pole fell was injured. In the Superior Court of Baltimore City, the company sued Ruth for damages but was defeated. On appeal the court sustained the judgment for the defendant, holding the erection of the pole to be in defiance of the rights of Ruth, and constituting an unlawful invasion of and trespass on his land. Said the Court:

"Planting telephone or telegraph poles along a public highway or a railroad right of way for other than railroad use, in the country where the title of the abutting owner runs to the center of the road subject to the right of way, is an appropriation of private property, and is unlawful, unless the right to do so has been acquired by contract or condemnation. The same principle applies with equal force to the planting of poles in a city or a private alley, * * * where the title of the abutting owner extends to the center of the alley, although a different principle would control the erection of poles on the public streets of the city whose beds are owned by the municipality."

The court denied that the title of the owner of the lot extended through the alley. It therefore found that Ruth was entitled to assert his right of abating the nuisance by cutting down the pole after reasonable notice to the company of his intention.

Maryland Telephone & Telegraph Co. vs. Ruth, 68 Atl., 358.

Electric Light Company Held for Damages to Telephone Company's Switchboard

On one of the streets of Jennings, La., the Cumberland Telephone & Telegraph Company and the Jennings Electric Light & Power Company each have a line of poles and wires on opposite sides of the street. As a result of a heavy wind one of the poles belonging to the electric light company was blown over so that it was leaning against a fence and over private property. The owner complained to the electric light company and men in its employ removed the pole, thus leaving a very long span and causing the electric light wires to sag badly. There were two wires leading from a telephone pole into a residence, passing under the electric light wires at a distance that was safe so long as the electric light wires were in proper position, but the removal of the pole permitted the electric light wires to lie upon the telephone wires. The electric light company was promptly notified of the trouble and requested to make repairs, but failed to do so, and the next night, during a heavy rainstorm, the insulation burned through, burning out the instrument in the subscriber's residence and setting fire to and slightly damaging the building. The current was carried into the switchboard, causing a damage amounting to about $1,200. Payment was refused after amicable demand, and suit was brought. At the trial it was found that the electric light company had been negligent in making repairs, that it had ample notice of the situation and that its current caused the damage, notwithstanding a strenuous effort on their part to show that the damage could have been caused by lightning. The telephone company offered testimony to show that its exchange was properly protected and provided with all the usual appliances for preventing such damage. The electric light company has appealed from the judgment.

Telephone a Legal Transmitter in Court Proceedings

The Supreme Court of Arkansas has declared the telephone a legal transmitter in court proceedings, a doctrine that is being put to very practical use in that State since the decision. Recently an aged negro died at the home of his stepson in Little Rock, where he had gone to make a visit. The old man's daughter went to see the remains of her father and found the corpse in the hands of an undertaker who refused to give it up or allow her to direct the funeral. Accordingly she applied for an injunction to compel the undertaker to recognize her authority instead of that of the stepson, but found the chancellor of the district away on a fishing trip. On her attorney communicating with the chancellor over the telephone, the latter refused to return, but consented to hear the case over the telephone. So the affidavits and papers in the case were read to the chancellor over the instrument and then the solicitors for the respective parties made their arguments in the same way. After a few minutes' meditation, the judge telephoned the clerk of the court denying the application for injunction.

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One Dollar for Every Unanswered Call

At Fort Smith, Ark., J. Johnson, the attorney who created a sensation some months ago by calling upon subscribers to the Bell telephone system to join him in putting the corporation out of business, and who secured a partial victory in the Chancery Court, has adopted unique means to secure satisfaction for what he claims is the poor service being given him by the company named. After the Chancery Court had decided that the service then given was not what was required by and within the bounds of a rational possibility, the company had the case transferred to the Federal Court, where it has since lain undisturbed by either side. Mr. Johnson came to the conclusion that he could not afford to continue prosecuting the case at his own expense, the subscribers showing no disposition to finance his efforts, though they registered protest after protest against the inefficiency of the service given. He, therefore, concluded that he was entitled to compensation for being compelled to await the convenience of the company in answering calls, and likewise concluded that he would keep a book of original entry, and when his account against the company became large enough to make it worth while, would sue upon it. For every call he sent in which he was not answered within a minute he charged the company $1, and he has brought suit in a justice's court to recover $20 for failure of the company to respond within one minute on 20 different and specified occasions. He said that he has come to the conclusion that the central force is not large enough to handle the business of the local system and he considers himself as possessed of a fine cause of action.

Duty to Warn Employee of Abnormal Dangers

The duty of an electric company to warn an employee as to abnormal dangers is not violated where from either the character of the work or other sources the employee is possessed of all the information which the company could have furnished regarding such perils. So the Supreme Judicial Court of Massachusetts held in a case where suit was brought against an electric company to recover for the death of a lineman. The electric wires of the company had become dangerous for want of proper insulation, so new wires were to be substituted. A gang of men, including the deceased, who was an experienced lineman, were sent out to perform the work, under the direction of a general foreman of the company. While working upon the cross-arms of the company, the lineman came in contact with a tap wire while stringing wires where it was clearly visible. The lineman had been informed of all the elements of danger attendant on his employment and was permitted to perform the work in his own way, and with the opportunity for unrestricted observation. Pembroke vs. Cambridge Electric Light Company, 84 N. E., 331.

Inter-Township Company Claims Itself Not Taxable by Georgia Townships

The Southern Bell Telephone Company, at Savannah, Ga., has filed suit for injunctions against the townships of Warsaw and Pooler, to prevent them from proceeding against the property of the company, in order to secure the payment of the taxes levied by the town council against the telephone company. The enjoining company asserts that the tax levy of the two townships is contrary to the constitution of the United States and the constitution of Georgia, and further avers that the company conducts business in the townships upon the interurban instead of the intraurban plan, and is therefore not taxable by the townships. The plaintiff further asserts that, were the taxes just, and by law payable to the defendant townships, the tax would not only counterbalance the profits of the telephone company in the townships, but would cause a yearly leak in the company's exchequer. For those and other reasons in law and equity, the plaintiff company asks that the townships be restrained from proceedings against the company.

No Rebate Allowed for Idle Telephones in Summer

Assistant Corporation Counsel Wetten, at Chicago, has submitted an opinion to President Sunny, of the Chicago Telephone Company, advising him that under the new ordinance of the company it could not grant rebates for telephones taken out of service during the summer months.

Many wealthy men, leaving for their country homes, have made it a rule to have their telephones disconnected during their absence. The purpose has been twofold—to save expense, and to prevent burglars from calling the house and discovering that it was vacant.

Practical Questions and Answers*

Extension Telephone and Bell—Series System (1050)

A subscriber has two series telephones and an extension bell on the same line. He wants it arranged in such a way that when the receiver is off the hook at telephone *A* it will cut telephone *B* and the extension bell out of the line, but in such a way that when receiver on telephone *B* is off the hook it will only cut the extension bell out, and leave telephone *A* on the line.

There are two ways of solving your problem. Fig. 1050*a* shows the first and easier of the two. Telephone *A* is connected to the line to central as usual. The line to *B* is cut in series with the ringing circuit of *A*. The extension bell is cut into the ringing circuit of *B* in the same way. When the hook at *A* is up, all the rest of the line is cut off. When the hook at *B* is up, the extension bell only is cut off, leaving the bell at *A* still on.

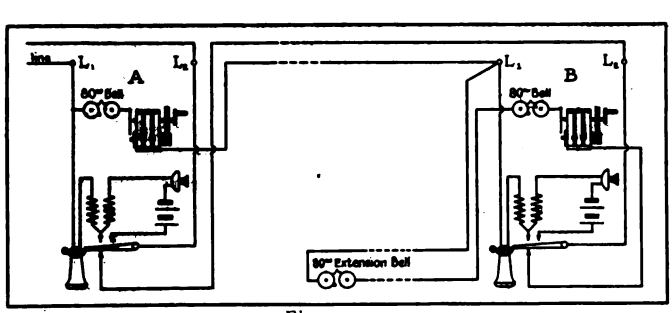

Fig. 1050a.

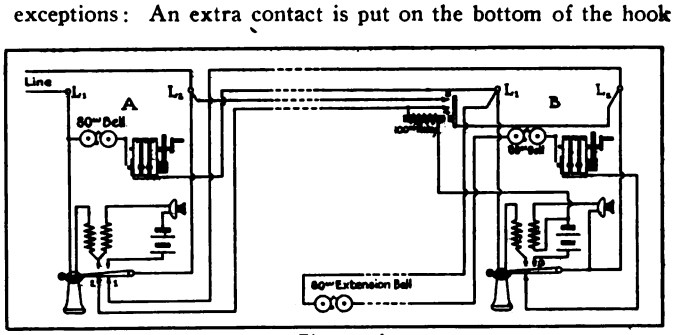

Fig. 1050b.

With this wiring if *A* should take his receiver off the hook while *B* is using the line it would cut *B* off. Fig. 1050*b* is free from this objection. The wiring is the same with the following exceptions: An extra contact is put on the bottom of the hook at *A*, and a 100 ohm relay is wired in between the battery in *B* and this extra contact at *A*. The induction coil in *B* must be in the condition shown. Some telephones are wired that way, but if not it must be made so. The insertion of a relay in the substation outfit is to be avoided if possible, but in this case it

*Answers to queries in this issue are furnished by Arthur Bessey Smith, Asst. Prof. in Telephone Engineering, Purdue University.

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is necessary, for the cutting off of B from the line is made to depend on which hook is operated first. If hook A comes up first, it must cut B off. But if hook B comes up first, something must be made to happen which will prevent hook A from doing what it did on the other occasion.

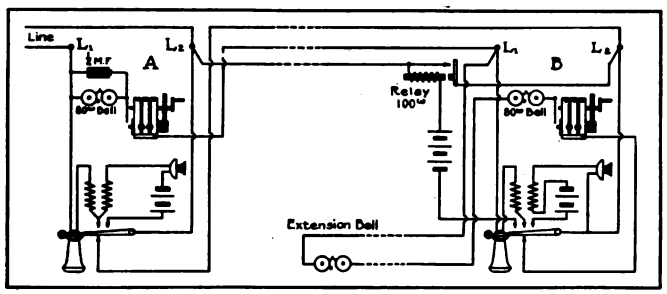

Fig. 1050c.

If the hook in B is raised first, current from the battery will flow through the relay and back through contacts 1, 2 and 3. This pulls the relay up, closing contact 4, which locks it in position. If now the hook at A be lifted, it will break contacts 1 and 2, which would normally cut B off were it not for contact 5 at the relay, which maintains B's connection to the line. It may be necessary to put in three cells at B, or to put them two abreast and two or three in series.

If desired a ½ M. F. condenser may be shunted around A's bell to give B a better talking circuit, and a local battery used to operate the relay, as shown. in Fig. 1050c.

Measurement of Small Inductances (1051)

In your query (1032) of Vol. 18, No. 1, the letters Q, S and P are used, but I fail to find any reference or representation of their values. You state that the condenser is used merely to keep the battery current where it belongs and will not affect the results—yet in the first balance you are supposed to disconnect the condenser, provided the receiver is used to balance the bridge. In the second place the battery current is not used to make a balance, but a source of A.C. current is used instead. I note also that the capacity of the condenser is used to complete the result in henrys.

The error in giving the formula to which reference is made came from using a different set of letters in developing it from those used in the article. To fit the letters used in Fig. 1032 the following statement of the formula must be used:

$$L = \frac{CA}{10^6}\left(r + \frac{rR}{B} + R\right)$$

Your mistake about the condensers is explained by the fact that there are two condensers, C and C'. The latter is the one which has no effect on results. The bridge is balanced twice, first the resistances, A, B, R_w and R, are brought into a proportional relation with regard to ohmic resistance only. This requires direct current, which is secured by throwing the switch, S_w, to the right. The second balance consists in adjusting the effect of the condenser, C, to neutralize the effect of the inductance, L, of the unknown. This requires alternating current.

As to the result, in henrys, being calculated by the use of capacity in microfarads, there is nothing unusual about it, as in formulas various quantities with different names are multiplied or divided to get results in still other units. As an example, take Ohm's law, $I = \frac{E}{R}$, where the electromotive force in volts is divided by resistance in ohms to get current flow in amperes.

TO WIRE CHIEFS AND MAINTENANCE MEN

Clearing the troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men. These the AMERICAN TELEPHONE JOURNAL *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

Telephone Finances

Expert Report on Rates at Minneapolis, Minn.

A report has been made to a City Council committee of Minneapolis, Minn., by the firm of J. Gordon Steele & Company, expert accountants, bearing upon the proposed city ordinance to fix maximum telephone rates, and affecting the Northwestern (Bell) Telephone Exchange Company. It would appear from the report that if the rates of this company were reduced to the level of those of the Tri-State Independent Telephone Company it would involve an annual operating loss of $29,180.

It has been claimed on behalf of the Northwestern Telephone Exchange Company that the proposed change in rates would inflict a loss of not less than $69,000. According to the report of the experts, the income under the present Northwestern rates, there being 16,438 subscribers, would be $646,280 annually, while under the proposed change it would be $590,244. The yearly expenses of operation would be $595,627, as against $619,425. Hence the deficit worked out by the experts reaches, as above noted, the sum of not quite one-half what had been alleged. The average annual rate for exchange service was $30.70, and the rent or receipts for toll service, $7.69, making a total of $38.39 a year. Against this the annual charges and expenses were $34.45 per station, leaving the annual average profit on each telephone $3.94.

The report discusses many interesting features, and among its most important comments are the following on depreciation: "The rate of depreciation on a telephone plant varies from 2 per cent on underground conduit to 12½ per cent on subscribers' stations. We have gone very carefully into the various items making up the Minneapolis construction and are of the opinion that the average rate of 7 per cent claimed by the company for depreciation is a very moderate one. The proper method of calculating depreciation is to make the calculation on the amount invested at the beginning of the year. This is done on the assumption that no depreciation accrues on any additions from the time they have been made until the end of the year. We have used this basis in making our calculations.

"The item of depreciation is a very important one and is not given sufficient consideration by many telephone companies. Equipment will only last a certain number of years even when kept in good repair, and it is against this depreciation which cannot be made good by ordinary current repairs that a sum must be set aside each year out of profits which will represent the amount of such wear and tear which occurred during the year, and when the equipment wears out and has to be replaced there will be a sufficient balance in the renewal reserve fund thus created equal to the original cost of such equipment.

"The Northwestern Telephone Exchange Company had no such reserve fund on its books at Dec. 31, 1907, which points to the fact that in the first years of its existence no reserve was made; but that the gross revenue after deducting the operating expenses and the exact amount expended on repairs was considered as profit and treated as such without considering the fact that a certain amount of depreciation had occurred, and ought to have been provided for out of the profits of these years, although the actual replacement was not to be made until it was rendered necessary.

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"Had such a reserve been created, the reserve fund would have an amount at its credit of approximately $1,500,000 on account of Minneapolis construction at Dec. 31, 1907. This would have gone to offset the amount invested in Minneapolis, but as no such reserve has been created we have not considered it in dealing with the construction account. This company, like many others, made the great error in accounting of not building up a renewal reserve fund in the beginning when the plant was new and no reconstruction was necessary, with the result that now it has to charge the total of its reconstruction against the revenue of the year in which it is made."

Stromberg-Carlson Financial Report

On Aug. 6 the directors of the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., issued a statement showing the company's financial condition on June 30, 1908. This statement was accompanied by comments by W. Roy McCanne, secretary and treasurer of the company.

It is the first report which has been issued since the reorganization of the United States Independent Telephone Company was begun. Mr. McCanne has pointed out in his note accompanying the report that the outstanding capital stock of the company is now $3,000,000, instead of $6,000,000 as heretofore, $3,000,000 of par value of common stock having been returned to the treasury. The assets have been correspondingly reduced by eliminating the $1,716,514.77 heretofore carried as "good-will and patent account," and by creating reserves to cover depreciation of buildings, equipment, merchandise and unascertained losses on accounts receivable, notes receivable and investments. Secretary McCanne announced that it is the plan of the board of directors to submit annually in the future, statements to the stockholders of the condition and earnings of the company, certified by Price, Waterhouse & Company or other certified accountants.

The financial statement is as follows:

ASSETS.

*Real estate, plant and equipment		$1,295,984.44
*Merchandise:		
Raw material, product finished and in process (Inventoried June 30, 1908).		1,027,152.72
Cash on hand and in banks		150,143.16
Unexpired insurance		4,188.59
*Accounts and notes receivable and investments	$2,073,913.37	
Liability on two-year notes of U. S. Independent Telephone Company	421,467.38	
		1,652,445.99
		$4,129,914.90

*These accounts have been reduced by amount of depreciation and other reserves heretofore created.

LIABILITIES.

Capital stock:			
Preferred (authorized and issued)		$1,500,000.00	
Common (authorized and issued)	$4,500,000.00		
Held in company's treasury	3,000,000.00	1,500,000.00	
Total stock outstanding			$3,000,000.00
Real estate mortgage:			
Chicago property, due Jan. 1, 1911			$80,000.00
Notes payable			920,000.00
Other liabilities (including accrued wages)			21,045.60
Surplus			108,869.30
			$4,129,914.90

The officers of the company are: President, Albrecht Vogt; vice-president, Edward W. Peck; secretary and treasurer, W. Roy McCanne; assistant secretary, Wesley M. Angle; auditor, J. Edmund Cooper; general manager, John W. Marder.

Increase in Total Taxes on Telephone Companies in Maine

The members of the Maine Board of State Assessors, Hon. George Pottle, of Lewiston; Hon. Otis G. Hayford, of Canton, and Hon. William J. Thompson, of South China, recently committed the annual excise tax on the telephone and express companies of the State. The total tax on the telephone companies is $44,501.81, against $40,406.22 at the last commitment, an increase of $4,095.59. The heaviest tax is assessed against the New England Telephone & Telegraph Company and the lightest against the Denmark Telephone Company.

The following are the taxes assessed against the various telephone companies of the State:

Aroostook Farmers' Telephone & Telegraph Company	$125.55
Aroostook Telephone & Telegraph Company	1,520.32
Cambridge Telephone Company	15.22
Center Lincolnville Telephone Company	27.46
China Telephone Company	29.00
Cumberland Telephone Company	20.05
Danforth Telephone Company	38.10
Denmark Telephone Company	14.71
Eagle Lake Telephone Company	15.39
Fort Kent Telephone Company	37.13
Half Moon Telephone Company	21.38
Hartland & St. Albans Telephone Company	31.11
Hebron Home Telephone Company	16.28
Knox Telephone & Telegraph Company	755.73
Lewiston & Auburn Telephone Company	205.35
Maine Telephone & Telegraph Company	201.36
Moosehead Telephone Company	94.28
Mt. Vernon Telephone Company	27.23
New England Telephone & Telegraph Company	39,140.04
New Sharon & Norridgewock Telephone Company	34.22
Northeastern Telephone Company	1,436.29
Ossipee Valley Telephone & Telegraph Company	286.21
Oxford County Telegraph & Telephone Company	59.83
Pine Tree Telephone Company	44.54
Plymouth Telephone & Telegraph Company	20.00
Poland Telephone Company	88.18
St. Francis Telephone Company	15.62
The Nash Telephone Company	47.54
Westbrook Telephone Company	87.07
West Penobscot Telephone & Telegraph Company	43.62
Total	$44,501.81

Rocky Mountain Bell Report

The annual report of the Rocky Mountain Bell Telephone Company for the year ending Dec. 31, 1908, is of interest, as it shows the development during the past four years, as well as financial results for 1907.

The growth of the system is shown by the following figures:

	1907.	1906.	1905.	1904.
Number of exchanges	133	129	120	106
Number of subscribers	42,235	40,496	32,317	24,757
Miles toll pole lines	7,000	6,879	6,386	6,176
Miles toll line wire	24,272	21,954	19,393	17,348

The following is the financial statement covering operations for 1907 and preceding years:

Income—	1907.	1906.	1905.	1904.
Exchange	$958,747	$846,137	$1,221,774	$1,043,410
Toll	509,867	479,323		
Other revenue	93,183	85,349		
Total	$1,561,797	$1,410,901	$1,221,774	$1,043,410
Expenses—				
General	327,967	247,533	1,003,042	871,649
Operating	499,990	426,899		
Maintenance	308,400	308,400		
Instrumental rental	73,053	62,297		
Other expense	62,034	54,889		
Interest	244,811	159,346		
Total expenses	$1,516,255	$1,259,365	$1,003,042	$871,649
Balance over all exp	45,542	151,536	218,732	171,761
Dividends	(4½) 106,627	(6) 141,041	(6) 138,228	(6) 135,888
Balance to surplus	def. $61,085	sur. $10,495	sur. $80,504	sur. $35,873

BALANCE SHEET DEC. 31.

Assets—	1907.	1906.	*Liabilities*—	1907.	1906.
Plant, &c	$7,815,158	$6,463,915	Capital stock	$2,369,500	$2,366,300
Supplies	4,496	241,380	Surplus	305,834	534,740
Stocks & Bonds	75,503	75,138	Debt	5,530,246	4,063,346
Bills & accts. receivable	388,086	303,549	Reserve	256,316	152,191
Cash	178,652	32,595			
Total	$8,461,896	$7,116,577	Total	$8,461,896	$7,116,577

*There was charged against profit and loss $167,820 expended for maintenance in excess of the appropriation, leaving accumulated surplus as above of $305,834.

Chicago Telephone Company's Report for the First Six Months of 1908

A detailed report of the earnings for the first six months of the present year has just been issued by the Chicago Telephone Company. The expense account, which shows a decrease from

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the first half year of 1907, does not include amounts expended for reconstruction, which totaled $506,849 for the half year, and were deducted from earnings after allowing for dividends. The following is the report for 1908 and the corresponding period last year:

	1908.	1907.
Revenue	$4,188,844	$4,180,909
Expense	2,696,918	3,022,570
Balance	$1,491,926	$1,158,339
Sundry net earnings	54,954	90,226
Total	$1,546,880	$1,248,565
Interest paid	87,435	63,321
Balance	$1,459,445	$1,185,244
Dividends paid	918,605	700,000
Balance	$540,840	$485,244
Expended on reconstruction	506,849	342,277
Surplus	$33,991	$142,967
Average number of telephone stations	211,156	180,178
Average capital stock	$18,372,100	$14,000,000

In presenting the report, President B. E. Sunny made the following statement:

"Rates under the new ordinance went into effect Dec. 1, 1907. It is not possible to make an exact comparison between the operations of 1907 and 1908 with reference to the effect of the new ordinance, which lowered rates materially, for the reason that the operations of the company in the city and outside of the city were not kept separately for 1907.

"A rough approximation of the effect of the new ordinance rates is that the receipts of the telephone company from 210,000 telephones (city and country) is the same as for 180,000 telephones at the old rate—a money difference of about $1,400,000 per annum.

"At the same time, the average capital account is increased $3,400,000 to in part pay for the 31,000 additional telephone stations.

"The operating conditions have been more favorable in 1908 than last year, in that the heavy repairs required because of frequent storms were less, and as a result operating expenses have declined."

British Telephone Corporation Reports on Business in Argentine Republic

The directors' report of the United River Plate Telephone Company states that for the year ended March 31 last the gross receipts in the River Plate were $1,214,900, as against $1,047,500 for last year. Deducting expenses in Argentina and London, debenture interest, dividend on preference shares, and interim dividend on ordinary shares, and adding interest on investments, transfer fees, etc., there remains a profit of $376,700, to which must be added $19,700 brought forward from the previous year, making an available balance of $396,400. The introduction of the common battery system has necessitated the replacement of part of the overhead by underground plant, and also other changes. The cost will be carried to a special replacement account as the work proceeds, and be gradually written off. After applying $121.125 to the reduction of this special replacement account, and after meeting the cost of paying off the old debenture stock and the issue of the new, the directors recommend that a final dividend of 5 per cent be paid upon the ordinary share capital of the company, making, with the interim dividend paid Dec. 31 last, a return of 8 per cent for the year, free of income-tax, and that the balance of $23,760 be carried forward. The new issue of ordinary shares referred to at the last general meeting has been made, and the whole amount subscribed. The first installment was payable on April 1, 1908, and only the amounts received in advance of the due date come into the balance-sheet.

Telephone News

Franchise Rights of New York Independent Telephone Company to Be Determined

The papers in the mandamus action of the New York Independent Telephone Company against Commissioner of Water Supply, Gas and Electricity John H. O'Brien, of the city of New York, have been served and the hearing will be had Aug. 21.

This is the action referred to in the communication of the United States Independent Telephone Company reorganization committee to the assenting bondholders last spring. In the communication it was stated that the officials of New York City had refused to recognize the franchise rights of the New York Independent Telephone Company, and that it would be necessary to take the matter into the courts to establish the validity of the franchise. The New York Independent Telephone Company on Sept. 27, 1905, received a deed from the Mercantile Electric Company, conveying to it all the property, rights, privileges and franchises which were granted to the Mercantile Electric Company in 1894.

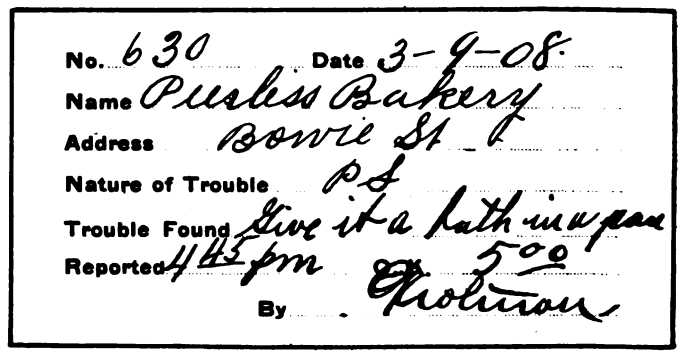
Some time ago application was made to Commissioner O'Brien by the New York Independent Telephone Company for permission to extend the lines of the company, but no decision has been given. The present action is brought to compel the commissioner to render a decision.

Independent Telephones for Court House at Houston Miss.

A report from Houston, Miss., states that recently the county board of supervisors ordered the sheriff to have all Cumberland (Bell) telephones removed from the court house. Hereafter the Independent service will be used exclusively by the county officers there.

Soaking a Desk Stand in Water to Brighten Metal Parts

The accompanying trouble ticket, forwarded by Mr. C. W. Emmer, manager of the Beaumont Telephone Company, Beaumont, Tex., shows a rather unusual case of trouble in a desk stand. It seems that the climate in Texas tends to discolor bright metal, and a subscriber, wishing to remove the discolora-


No. 630 Date 3-9-08.
Name Peerless Bakery
Address Bowie St
Nature of Trouble P.S.
Trouble Found Give it a bath in water
Reported 4:45 pm 3-9-08
By Robinson

A Trouble Report from Texas.

tion, placed the set in a pan of water. A troubleman, upon searching for the cause of the trouble found that the desk set had had a good soaking in the water without improving the looks of the set, and with the effect on its operation which might be expected.

Important Case Against Traction Company in Illinois

Testimony has been taken recently in the Circuit Court of Logan County at Lincoln, Ill., in the case of the American Telephone & Telegraph Company vs. the Springfield & Northeastern Traction Company. This is an injunction suit arising from a project which would result in parallel over-building of

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a telephone line by a 33,000 volt power line in the city of Lincoln, Ill. Testimony is being taken before a Master in Chancery, and the case is not yet concluded.

Evidence on both sides has been given by some of the ablest technical men in the country. Power engineers of the highest reputation have been called upon to testify for the plaintiff. Among those who gave expert testimony was Mr. F. F. Fowle, the well-known consulting and electrical engineer, of Chicago, Ill.

Practical Papers at the Florida Convention

Among the papers read at the recent convention of Florida Independent telephone men were several very interesting discussions of general conditions, and others giving accounts of the experiences of members in various branches of practical work. Among the latter was a discussion of the directory, by Mr. W. U. Lathrop, of the Peninsular Telephone Company. He recently issued an edition of 750 copies, and made it a paying investment by obtaining advertisements from the business men of his territory. St. Petersburg, Fla., gets out four directories a year, and the publication of each edition is given to some live merchant, who gets up the directory free of expense to the exchange. Mr. Lathrop deems telephone directories the best advertising in which one can invest.

Speaking on the topic, "Subscribers and Collections," Mr. Ed. Scott said that the Arcadia exchange has 220 subscribers in town and 40 in the country. It is of no use to solicit subscribers until a new system is working well, but then is the time to hustle. A good way to obtain subscribers in the country is to get one member of a large family scattered on several places. Once they get a taste for telephoning, they just can't do without it, said he. He sends out his bills on time and demands prompt payment or no service. Three per cent would cover his loss on a year's business.

Dr. P. W. Butler remarked that he did not send out bills, but had educated his subscribers to come and settle at the end of each quarter. His collections average 98 per cent, and his exchange has 105 subscribers. The Sanford system demands a deposit of $3 a telephone, which amount is remitted at the end of the year.

"Rates: How to Raise Them" was the topic discussed by President W. G. Brorein. He spoke of the importance of

Mr. W. G. Brorein,
President.

the telephone industry exceeding all others. It takes, he said, about 15 per cent to keep lines in repair, and the cost of the service grows as the number of telephones increases. Take the people into your confidence; have a heart to heart talk with them, and if you are sincere and honest in your transactions, which you must be, and show users of your system that rates are too low, you will have no trouble to secure an advance. This he did in Tampa with gratifying results, and rates which were formerly $2.50 are now $4.50. In raising rates the company must give as perfect service as it is possible to give. The best built line is not too good. Lines must build for service. A rate of $1.50 in Florida is too low. An exchange with 200 telephones should not charge less than $2, and the user is getting his service cheap even at that figure.

Mr. G. R. McKean,
Secretary-Treasurer.

Vice-president E. E. Voyle, speaking of the "Construction of Toll Lines," deplored poor construction. He said it is always preferable to construct the line along a railroad, as 50 ft. of the way is cleared. It pays in Florida to clear a space through all timber lands 100 ft. wide, to prevent the trees from damaging the line when they fall. As to right of way, in many instances, seeing the importance and benefit of telephone communication, the people give rights of way. Others demand financial settlement, and in these cases he always satisfies reasonable demands. In running along public roads it is preferable to get rights of way in the fields 25 ft. back from the road, so as to avoid cutting of the underbrush back from the road.

Mr. Brorein remarked that it is economical to treat poles by the application of creosote or other wood preservatives.

Mr. J. A. Helvin participated in the discussion of this topic.

Mr. Fernald said: "In the early construction the thought was 'how cheap can the work be done?' Now that the telephone is a fixture, lines must be constructed for permanency."

One of the delightfully informal episodes which marked the closing of the convention was the consummation of an idea, originated by the representatives of the telephone supply companies who, as a slight testimonial of esteem for Secretary G. R. McKean of the Ocala Telephone Company, and the generous, hospitable and thoughtful way in which he had treated them, presented him with a beautiful Elk stick pin, mounted with a brilliant diamond. Mr. J. A. Helvin was the spokesman. This recognition to Mr. McKean's worth as a host and ideal qualifications as a toastmaster enthused the gathering, and the pleasing incident was made the occasion of sincere congratulations.

Ohio Independents Commend Decision Against Delphos Home Telephone Company

Following up his decision affirming the validity of the 99-year exclusive contract between the United States Telephone Company and the Delphos Home Telephone Company, Judge Quail, of Lima, has granted a temporary injunction against the Spencerville Telephone Company to prevent its giving service to any other than the United States Telephone Company. A similar injunction has been granted against the

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Wapakoneta Telephone Company, of Wapakoneta. Since Judge Quail rendered his decision against the Delphos company, it has been the chief topic of discussion among the Independent men throughout the entire State, and the general sentiment among the local companies, both large and small, is that this will be of substantial advantage in clearing up the somewhat complicated relations which have begun to develop in certain quarters, and will be of general benefit to the Independent business.

A typical statement is that which General Manager J. H. Ainsworth, of the Home Telephone Company, of Dayton, Ohio, made to a representative of the AMERICAN TELEPHONE JOURNAL. He called attention to the great development of the Independent business, which was made possible by the building of long distance lines of the United States company under the guarantee afforded by the 99-year exclusive contracts. Mr. Ainsworth referred to Delphos and other exchanges which have attempted to use the Bell lines, some of which are already slated for proceedings in the courts similar to those instituted with respect to the Delphos contract. He said that "this is the first case of the kind decided, and it means much to the Independent telephone people of Ohio as well as to the general public. Competition in the telephone business is recognized as a benefit, and this decision certainly presages the failure of attempts to break it down."

Induction from Traction Lines High Tension Alternating Current Causes Removal of Telephone Wires

Reference was made in these columns some weeks ago to the troubles experienced on a toll line between Decatur and Fort Wayne, Ind., as a result of the operation of a three-phase high-tension alternating current traction line.

The induction was so severe that conversation over the toll lines was impossible, and service was discontinued. Now men are at work building between the two cities a new line sufficiently far removed from the traction line to avoid the possibility of further trouble.

Our local correspondent states that the situation is arousing a great deal of interest and discussion in Indiana at present. It is understood that negotiations are being carried on with respect to the adjustment of damages to the telephone company, but if these fail the courts are likely to be called upon to settle the question.

Telephone companies in a number of places have been obliged to abandon their lines and build a mile or more away from the wires of traction companies using the three-phase, alternating-current system, and this trouble is likely to be experienced in many localities in the future. In Indiana, especially, officers of telephone companies hope that before long a case may come up in the courts which will establish their rights under such circumstances.

Service Troubles in Louisiana's Capital

Telephone users in Baton Rouge, La., are reported to be up in arms over the failure of the Cumberland Telephone & Telegraph Company to give connections with the West Side. It seems that a submarine cable connecting the two sections of the city is out of commission, and the company has announced that it will be four months before a new cable can be obtained and laid across the Mississippi to restore connections. At the same time, it is found that the company gives connections with pay stations on the other side of the river, routeing messages in a roundabout way over toll lines. This discovery has increased the dissatisfaction with the present conditions.

Educational

The University of Minnesota has recently issued a bulletin listing the various courses given in the College of Engineering and Mechanic Arts. The length of the engineering courses has been increased from four to five years. This is done for the purpose of adding to the amount of general culture work and also for rearranging and increasing the technical work. A degree of Batchelor of Science will be given upon the completion of four years' work, and the degree of Electrical (or other) Engineer given when the full five years' course is finished.

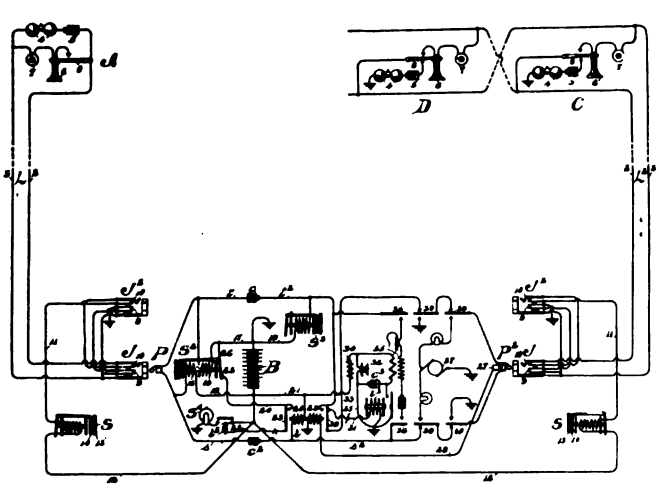
Telephone Patents

TELEPHONE SYSTEM.

William W. Dean, Chicago, Ill., patent 895,166, Aug. 4, 1908

This invention relates to supervisory signals employed in the cord circuits of a multiple switchboard.

Supervisory signals S^2 and S^3 of the mechanical type are associated with each end of the cord circuit, and are negative in



character; that is, they become inert when the receiver is restored to the switchhook at the termination of the conversation. A pilot supervisory lamp S^4, controlled by relay r^2, is positive in action, becoming illuminated when the other supervisory signals are rendered inert. The mechanical signals S^2 and S^3 may be replaced by relays and lamps at any time in case the mechanical type of signal is not desired.

TOLL COLLECTING BOX.

George A. Long, Hartford, Conn., patent 894,388, July 28, 1908.

This invention covers a toll collecting box provided with a system of safety devices intended to resist all attempts to gain access to its contents. The collector of the company has a key which will permit him to remove the box from the telephone and replace it with another. The treasurer's office is provided with a key which will open the box, permitting the coins to be removed. The safety devices are then reset and the box is ready for use.

INCANDESCENT LAMP.

William W. Dean, Chicago, Ill., Patent 894,193, July 28, 1908.

This invention relates to improvements in the incandescent lamps used for signaling on telephone switchboards. The terminals of the lamp, which are of thin sheet metal, are curved transversely to fit the curvature of the bulb so as to form practically an inclosing cylinder. At the base of the lamp the terminals are extended so as to form a wedging surface. The space between the projecting terminals is filled with insulating cement or some other insulating material. Longitudinal ribs are formed upon each side of the center line of the terminals to provide engaging surfaces for the jack springs.

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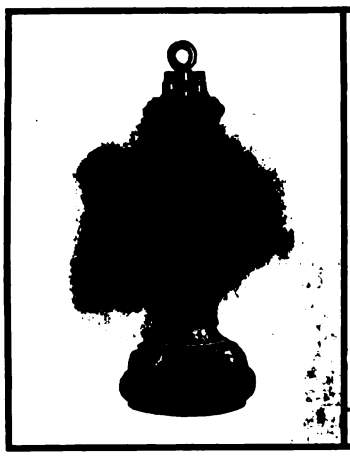
Manufacture and Design

The Ericsson Receiver

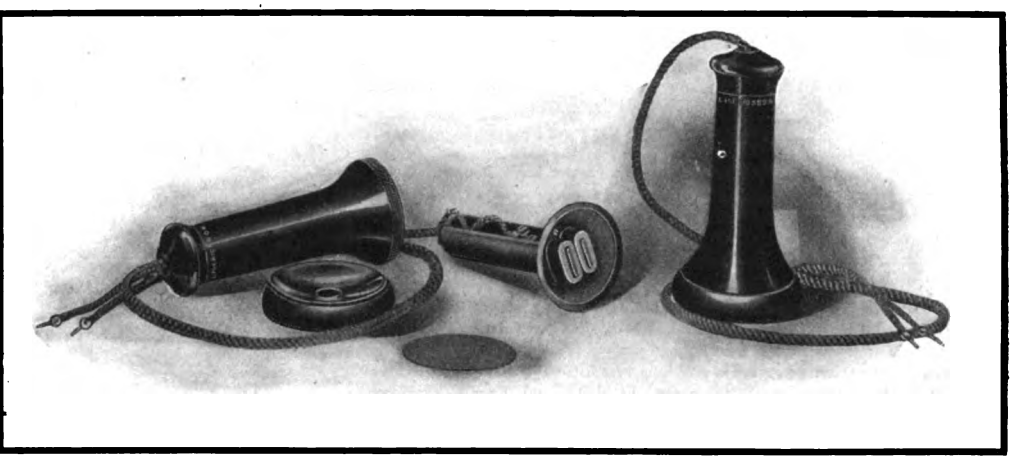
The activity of the L. M. Ericsson Telephone Manufacturing Company, of Buffalo, N. Y., in manufacturing and marketing its telephone receivers has attracted considerable attention to this branch of the company's work. The Ericsson company has an exceptional record in receiver manufacture, as L. M. Ericsson is credited with the invention of the first bipolar receiver as early as the year 1879. The design of this receiver was shown in a Swedish publication at a very early date, credit for the invention being given to Mr. Ericsson. This receiver, which was invented so long ago, proved to be so successful that all its essential elements have been retained in modern practice, the instrument being almost similar to the No. 1 receiver which is made by the Ericsson company to-day. The only change of importance has been the substitution for the leather covering, used when the instrument was first invented, of a hard rubber shell.

Although the No. 1 receiver is suited to all practical purposes, the Ericsson company has realized that there is an extensive popular demand for an all-rubber type of receiver with concealed binding posts. Accordingly the company has designed a receiver which embodies these features, still retaining all the essential parts which demonstrated their practical value in the No. 1 receiver.

In addition to these two types of receivers the Ericsson company manufactures a lineman's testing receiver and an operator's head receiver, which are designed and constructed according to the same high standards governing the manufacture of receivers for subscribers' sets.



The No. 1 Ericsson Receiver.



The No. 2 Ericsson Receiver, Assembled and Disassembled.

Prosperity Report

That business is returning to its normal condition is evidenced by a report received from the Miller Anchor Company, of Norwalk, Ohio. Orders have recently been received and filled for nearly 29,000 of the various sizes of the well-known Miller anchor. These were shipped to the following companies: The Washington, Baltimore & Annapolis Electric Railroad Company, the Chesapeake & Potomac Telephone Company, the North Electric Company, Dallas, Tex.; the A. S. Register Company; the Wisconsin Telephone Company, Milwaukee, Wis.; the Union Telephone Company, Alma, Mich.; the Michigan State Telephone Company, Detroit, Mich., and the Chicago & Milwaukee Traction Company.

This anchor is becoming quite popular on account of its cheapness and adaptibility for various purposes. A large stock of the different sizes is always on hand and orders are given prompt attention.

Sound Proof Telephone Booths

The use of booths in connection with public telephone pay stations is rapidly becoming general. Every telephone company has a number of these booths in use in various places. Their use is not confined entirely to public pay stations, for many firms which frequently use long distance lines have booths installed in their offices so that conversations may be carried on without disturbing the office force and also insuring privacy.

Booths are therefore demanded which will not occupy much space, but at the same time they must be large enough so that they will not inconvenience the parties who use them. In addition to this, the booths must present a neat and attractive appearance so that they may be installed in any public or private place and harmonize with the rest of the fittings.

Among the booths which represent the best modern ideas are those manufactured by the Buffum Tool Company, of Louisiana, Mo. These are made throughout of the best grade of oak, carefully finished in golden oak, having molded panels and dentaled cornice, thus being ornamental as well as serviceable. The sides, door and top are made double with an air space between, thus making the booth as near sound proof as possible. Double-strength glass is used in the sides and door, the inner glass being removable for cleaning purposes. One of the features of these booths is the interchangeability of the sides, so that the glass may be placed on whichever side is desired.

The Trumbull Electric Manufacturing Company, of Plaineville, Conn., in the latest number of its interesting booklet "Trumbull Cheer," which is issued monthly, shows a unique advertising device which was displayed in a window of the Electric Railway & Manufacturers' Supply Company, of San Francisco, at the time of the visit of the American warships to that port. A representation of a battleship, with hull, smokestacks and guns made of Trumbull plug cut-outs and fuses was set up. The booklet shows a cut of this remarkably ingenious device, which indicates the possibilities open to a skilful advertiser.

The Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., has been preparing some very interesting souvenir postal cards showing views of parts of its plant. One of the series which is being mailed at present shows the water tower and power plant. The tank of the water tower is set high above the buildings, to afford the necessary pressure for protection against fire, and incidentally presents a convenient display point for the words "Stromberg-Carlson Telephones," advertising the company's product to all persons in the vicinity.

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Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

PERSONAL

MR. ERNEST C. GRAVES, who for two years has occupied the position of manager of the Citizens' Telephone Company at Port Townsend, Wash., has been appointed special agent for that company. The territory which is to be covered by Mr. Graves includes the entire Northwest, and Port Townsend is among the exchanges which are to be under his supervision.

MR. E. MARTIN has been appointed superintendent of telephones for the Alberta Government at Strathcona, Alb., Can.

MR. WILLIAM POGUE has been elected manager of the Whitley County Telephone Company's exchange at Valparaiso, Ind.

MR. CHESTER C. PRATT has been appointed superintendent of the Utah Division of the Rocky Mountain Bell Telephone Company, with headquarters at Salt Lake City.

MR. C. R. WOODS, of Fort Madison, Ia., has been appointed manager of the Mississippi Valley Telephone Company's exchange at Burlington, Ia.

NEW COMPANIES

EL MONTE, CAL.—Articles of incorporation have been filed by the El Monte Home Telephone Company, whose purpose is to construct and operate telephone lines. It has an authorized capital stock of $25,000, and the incorporators are: J. S. Killian, F. P. Sappington, E. O. Fawcett, I. Kauffman and A. P. Snell.

LEESBURG, IND.—Articles of incorporation have been filed by the Public Service Telephone Company, and the following directors elected: A. H. Brown, H. E. Kinsey, Frank Bortz, J. E. Armstrong and W. H. Stanley. For some time past the organizers of this company, plans for whose formation have been previously mentioned, have been endeavoring to acquire possession of the plants of the Royal Telephone Company and the Home Telephone Company in Leesburg. Their efforts, however, having been unavailing, it is the company's intention to at once commence the installation of an entirely new system. The capital stock of the new concern is given at $20,000, and 150 contracts have already been secured.

PALMYRA, IND.—The Palmyra Home Telephone Company has been incorporated, and contemplates the construction and operation of telephone lines and exchanges in Harrison, Floyd and Washington counties. It has an authorized capital stock of $7,500, and the incorporators are George A. Beach, L. A. Kahl, Floyd Thompson, H. T. Brown and Edward Wenning.

ARLINGTON, KAS.—Among the newly incorporated companies is the Arlington Central Telephone Company, which expects to install and operate an up-to-date telephone system in this city. It is capitalized at $5,000, and those responsible for its formation are: A. C. Polk and E. Mayes, of Prague; C. C. Pharris and others.

LESLIE, MICH.—Articles of incorporation have been filed by the Leslie Home Telephone Company of this city. It has an authorized capital stock of $30,000, and expects to install and operate a modern telephone system.

CYRUS, MINN.—The Cyrus Mutual Telephone Company of this city has filed articles of incorporation. The capital stock is placed at $13,500, and among the incorporators are: H. C. Estly, O. E. Bjirgaad, L. L. House, John J. Kara and C. P. Carison.

KRAGNES, MINN.—The Oakport & Kragnes Telephone Company, which intends to operate a telphone system between Oakport and Kragnes, has filed articles of incorporation with the secretary of state.

BETHANIA, N. C.—The Rural Telephone Company, which contemplates the erection and operation of telephone lines in Forsyth, Surry, Stokes, Yadkin, Wilkes, Davie, Rockingham, Davidson and other counties, has filed articles of incorporation. The company is capitalized at $24,000, and the incorporators are: W. B. Little, H. A. Peddycord, Geo. H. Hauser and others.

COOKEVILLE, TENN.—At a recent meeting of a number of citizens of this city the Cookeville Home Telephone Company was formed, and a canvass for subscribers in Cookeville and throughout Putnam County is to be inaugurated at once. The organizers are planning for the installation of an exchange at this city, and the construction of lines throughout Putnam County, it being their intention to eventually establish connections with the lines of the Home Telephone Company which operates in Jackson, Smith, Macon, Trousdale and Sumner counties. Among those interested in the enterprise are: T. L. Denny, Griffin Smith and J. R. Douglas.

WOODLAWN, TENN.—Due to the efforts of a number of prominent farmers in the neighborhood of Woodlawn, the Woodlawn Independent Telephone Company has been organized, and a line constructed to Brownsville. Many other extensions in its system are to be made.

MOAB, UTAH.—The La Sal Mt. Telephone & Electric Company of this city has been organized, and the following officers elected: President, D. L. Goudelock, Carlisle; secretary, D. M. Cooper, Moab; manager, W. J. Meadow. The company has constructed 65 miles of line, and is considering other extensions.

TACOMA, WASH.—Articles of incorporation have been filed by the Puyallup Valley Home Telephone Company of this city. It is capitalized at $80,000, and those responsible for its formation are: P. W. Milburn, Geo. B. Woodbridge and James A. Colby, all of Tacoma.

GREEN LAKE, WIS.—The Green Lake Rural Telephone Company, which contemplates the installation and operation of a telephone system in Green Lake, has been organized, and the following officers elected: President, R. H. Buckland; vice-president, H. H. Janes; secretary, Byron Chapel; treasurer, George Thrasher. The directorate is made up of: George Thrasher, L. D. Patterson, H. H. Janes, Byron Chapel, R. H. Buckland.

MILWAUKEE, WIS.—Announcement is made at this city that the Newton & Osman Telephone Company, of Liberty, Manitowoc County, has filed articles of incorporation. It has an authorized capital stock of $2,500, and the incorporators are: John Dunbar, T. J. Walsh and D. Grady.

CRESTON, B. C., CAN.—The Creston Power, Light & Telephone Company, Ltd., of this city, which contemplates, among other things, the construction of telephone lines, has been organized. Its capital stock is placed at $20,000, and the following officers have been elected: Geo. M. Benney, president; James Compton, vice-president, Guy Lowenberg, secretary and treasurer.

FINANCIAL

PEKIN, ILL.—At a recent meeting of the stockholders of the Farmers' Mutual Telephone Company of Tazewell County it was reported that $11,000 of the $20,000 stock had been collected, and that the balance would be forthcoming in a very short time. Construction work is to be carried on as rapidly as possible, and an active canvass for business is being made.

CLINTON, IA.—The amended articles of incorporation of the Tri-City Telephone Company contain the following provisions: After the payment of dividends on the preferred stock at the rate of 7 per cent per annum, and the setting apart from time to time of such sums, if any, as the Board of Directors shall deem necessary to be used as working capital out of the net earnings, all the rest and residue of the net earnings of the corporation shall be treated as earnings upon the common stock, and may be declared and paid as dividends on said common stock as the Board of Directors shall determine.

VINCENT, IA.—The capital stock of the Vincent Telephone Company has been increased to $30,000.

BOWDON, N. D.—The Bowdon Telephone Company has increased its capital stock from $2,500 to $10,000, and expects to make many improvements in its system.

DENNISON, OHIO.—At a recent meeting of the stockholders of the Tuscarawas County Telephone Company, at which a most prosperous condition of affairs was reported, a dividend of 1 per cent on the common stock was declared.

GALLIPOLIS, OHIO.—The capital stock of the Gallipolis Telephone Company has been increased from $50,000 to $100,000.

LA CROSSE, WIS.—It is the intention of the La Crosse Telephone Company to issue bonds to the amount of $100,000 to provide for the proposed extension in its lines.

FRANCHISES

CHICAGO, ILL.—It is expected that final action on the ordinance granting the Chicago Telephone Company the right to operate in Morgan Park will be announced very shortly.

NEWPORT, KY.—A bid for the telephone franchise in this city has been made by A. H. Finke, presumably a representative of Bell interests. In one proposition an offer of $250 for the franchise is made, the rates to be as follows: Individual and business telephones $9 per month; straight residence, $4; two party residence, $3. The second offer is the same for the franchise, but makes the rate for business telephones $5; straight residence, $3 and two party residence, $2. In addition, Mr. Finke offers to connect the subscribers with Bell lines in contiguous territory.

KALAMAZOO, MICH.—Application has been made to the city council by the Citizens' Telephone Company for permission to establish an exchange in this city, and build lines on a number of the streets.

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FLINT, MICH.—An ordinance permitting the Interstate Long Distance Telephone Company to construct lines throughout this city has passed its first and second reading, and has been referred to the ordinance committee for examination. The admission of the company to the city, which now seems assured, will give it the long distance privileges it has been desirous of obtaining.

ROCHESTER, MINN.—An application for a franchise at this city has been made by the Tri-State Telephone Company.

COLDEN, N. Y.—The right of way to construct telephone lines between this city and Glenwood has been secured by the Boston Valley Telephone Company, and work is to be commenced at once.

SHARON, PA.—A telephone franchise for the Bell Telephone Company of Pennsylvania recently passed its first reading at a meeting of the City Council. According to the terms of this grant the franchise is to be operative for 25 years, instead of 50 years as stipulated by the Bell Company; free telephones are to be provided for all city offices, as well as borough officials; the price of telephones shall not be increased during the life of the contract, and free service shall be granted to all parts of the county. It is doubtful if the Bell Company will accept a franchise under the above conditions.

WOONSOCKET, R. I.—It is quite probable that the franchise applied for by the Providence Telephone Company in this city, which is to be operative for eight years, which provides for the furnishing of half-rate telephones for city departments and officials, the payment of 1 per cent of the company's gross local receipts annually and the use of the telephone conduits for police signal and fire alarm telegraph wires, will be granted.

MUD, TEX.—Permission has been granted by the county commissioners to J. T. Maxey, a prominent citizen and the postmaster at Mud, to construct a telephone line from that city to Austin, a distance of about 25 miles.

CONSTRUCTION

WICKENBURG, ARIZ.—The lines of the Consolidated Telephone, Telegraph & Electric Company in this city are being thoroughly overhauled, a new switchboard installed and the plant made modern in every particular.

BURNT RANCH, CAL.—Arrangements are being made by the U. S. Government for the construction of a telephone line from Burnt Ranch to Willow Creek, and thence to Korbel. This will be a great convenience to the people of Willow Creek and the Lower Trinity section.

LA MESA, CAL.—The Pacific Telephone & Telegraph (Bell) Company expects to extend its lines from this city to Lemon Grove.

CRESTED BUTTE, COLO.—Plans are being discussed by the Crested Butte Telephone Company for the construction of a telephone line to Aspen, by way of Brush Creek and Pearl Pass.

DENVER, COLO.—Work on the proposed line into the Royal Gorge has been commenced by the Colorado Telephone Company of this city.

BOISE, IDAHO.—The Bagdad Chase Gold Mining Company, which has its headquarters in this city, is constructing a line from Alexander Flat to Twin Springs.

COEUR D'ALENE, IDAHO.—Work is soon to be commenced by the Rocky Mountain (Bell) Telephone Company on the construction of a new toll line between this city and Wallace. A new line is also to be erected between Ross and Sandpoint.

PIERCE, IDAHO.—The Snyder Telephone Company's line from Pierce to Kendricks is to be reconstructed. Many improvements in the exchange at Orofino are to be made, and the toll lines from Orofino to Pierce, and from Orofino to Kendrick, are to be thoroughly overhauled.

CHICAGO, ILL.—The lines of the Chicago Telephone Company are being extended at a rapid rate to take care of its increasing business.

MINONK, ILL.—Steps were taken at a recent meeting of the managers of a number of Independent telephone systems in this state to secure Peoria connections for the users of Independent lines. The exchanges represented were those of Minonk, Benson, Roanoke, El Paso, Eureka, Pekin, Lexington and Washington, and it was decided to commence construction work at once. Service from Minonk is to be through El Paso, Secor, Eureka, Washington and thence over the Pekin line. The El Paso line is to be extended to meet the line from Minonk half way. Benson is to secure service by way of El Paso, and Roanoke will connect with a spur near Secor. It is estimated that about $8,000 will be expended on the proposed work.

SHELBURNE, IND.—The Mutual Telephone Company of this city, which has recently doubled the capacity of its switchboard, and strung a considerable amount of additional cables, expects to make many other improvements in its plant.

TERRE HAUTE, IND.—New lines are being built by the Citizens' Telephone Company to accommodate its new subscribers.

YOUNG AMERICA, IND.—The Home Telephone Company is materially enlarging its plant in this city.

BEDFORD, IA.—The lines of the Bedford Telephone Company in Bedford are being reconstructed, and a number of other improvements are planned.

ELKHART, IA.—The lines of the Standard Telephone Company are being rebuilt in this city.

LONG GROVE, IA.—In addition to the installation of an up-to-date telephone system in this city, it is the intention of the newly organized Long Grove Mutual Telephone Company to construct, maintain and operate telephone lines and exchanges throughout the state of Iowa.

SIBLEY, IA.—Among the new lines being erected by the Western Electric Telephone Company is a copper circuit between Sibley and Forest City.

HOWELL, MICH.—The Interstate Telephone Company, which operates a toll line from Howell to Hartland and Highland, and is extending it to Milford, is considering the advisability of rebuilding its plant in Howell. It is estimated that at least $30,000 will be expended in making its plant in this city un-to-date in all details.

LUDINGTON, MICH.—Arrangements are being made by the newly organized United Telephone Company of Michigan, which expects to install a modern system at Ludington, to construct a number of rural lines throughout Mason County.

FERGUS FALLS, MINN.—Work on the installation of its system in this city is being carried on by the French Telephone Company.

NATCHEZ, MISS.—Many improvements in its plant in this city are being made by the Cumberland Telephone & Telegraph (Bell) Company.

FULTON, MO.—The lines of the Red Star Telephone Company are being extended in Fulton.

JAMESON, MO.—The Jameson Telephone Company, which is erecting a new exchange building in Jameson, has commenced the construction of new lines throughout the city.

NEW FRANKLIN, MO.—The Mutual Telephone Company is constructing a number of new lines in New Franklin, to take care of its greatly increased business. Long distance service is obtained by connecting with the lines of the Kinloch Company at Boonville.

SPRINGFIELD, MO.—Material improvements in its plant in this city are being made by the Ozark Bell Telephone Company.

UNIVERSITY, PLACE, NEB.—The Automatic Telephone Company, which contemplates the expenditure of $5,000 for new equipment in its central office at University Place, is also planning for the construction of a trunk line to Bethany.

SANBORTON, N. H.—New lines are being erected in Sanborton by the Citizens' Telephone Company.

CAMDEN, N. Y.—The new construction work to be done by the Camden Home Telephone Company includes the erection of a line to Sylvan Beach and another to Talberg.

PAVILION, N. Y.—The Pavilion Telephone Company, which was recently incorporated with a capital stock of $10,000, is at work on the construction of its system. The territory to be covered is from north of Wyoming to south of the D., L. & W. R. R., and from east of East Bethany to near Linwood.

GREENSBORO, N. C.—The Southern Bell Telephone & Telegraph Company, which has hitherto reached Durham by way of Burlington and Raleigh, expects to install a direct circuit between Greensboro and Durham.

COLUMBUS, OHIO.—Work has been commenced by the Columbus Citizens' Telephone on a new branch exchange in Indianalo, a part of Columbus, in which the most modern equipment is to be installed. This makes the fourth branch exchange for this company in Columbus.

EUGENE, ORE.—The Pacific Telephone & Telegraph (Bell) Company is planning for the reconstruction of its system in Eugene.

OREGON CITY, ORE.—About $10,000 is to be expended by the Pacific Telephone & Telegraph (Bell) Company in Oregon City and Clackamas County. Cables are to be constructed into Gladstone, Parkplace, West Oregon City, Ely and Mount Pleasant districts.

POTTSVILLE, PA.—Plans are being discussed by the Bell Telephone Company of Pennsylvania for the erection of a new exchange building in Pottsville.

READING, PA.—The Mt. Aetna & Bethel Telephone Company, which has been extending its lines in many directions, expects to establish connections with Reading via Womelsdorf at an early date.

WOODBURY, PA.—On account of an increase in rates recently proposed by the Bell Telephone Company of Pennsylvania, the farmers residing in the western part of Gloucester County are arranging to construct a line of their own to Woodbury, where connections are to be established with the Keystone Telephone Company.

ALAMO, TENN.—The recently organized Alamo Home Telephone Company is arranging for the construction of a line to Bells. Lines are also to be built to Crockett Mills, Johnson's Grove, Cross Roads, Foster, and, in fact, throughout Crockett County. It is quite probable that the company will have in the neighborhood of 500 telephones installed during the next few months.

AMARILLO, TEX.—H. H. Davenport & Company, who are the engineers and contractors of the Panhandle Telephone & Telegraph Company, a corporation organized under the laws of Arizona with a paid-up capital of $500,000, and with a permit to do business in the state of Texas, are installing a first-class exchange in this city, in which 100,000 feet of cable,

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36,000 feet of conduit and a full multiple 1200 line common battery board are being used. The pressed brick and stone building, which is being constructed especially for the central office, will be one of the best buildings in the city, and will have every modern convenience.

LEHI, UTAH.—The lines of the Rocky Mountain Bell Telephone Company in Lehi are being thoroughly overhauled.

ASHLAND, VA.—The King William Telephone Company, with headquarters at Ashland, is building a line into Hanover and Caroline Counties, which will give it connections with Mangohick, Callno, Luther, Hanover Courthouse, Hanover Depot, Cardwells, Wickhams, Taylorsville, Dawn and Doswell. It is the company's intention to later connect with Duane, Beulahville and Etna Mills.

SUFFOLK, VA.—The Atlantic Coast Telephone Company is planning for the installation of a new exchange at Holland, Va., and the construction of a number of new lines.

RIVERSIDE, WASH.—The Johnson Creek Telephone Company, which now operates lines between Riverside, Omak and Okanogan, expects to still further extend its system throughout Okanogan County.

SNOHOMISH, WASH.—The plant of the Farmers' Telephone Company in Snohomish is to be materially enlarged.

PARKERSBURG, W. VA.—A new exchange is being installed in this city by the Citizens' Telephone Company, and lines are to be constructed throughout the city.

FOND DU LAC, WIS.—About $8,000 is to be expended by the Wisconsin Telephone Company in improving its plant in Fond du Lac.

MINONG, WIS.—A number of new lines are being erected by the St. Croix Farmers' Mutual Telephone Company, and long distance connections have now been established over a considerable portion of northern Wisconsin and Minnesota.

PORTAGE LA PRAIRIE, MAN., CAN.—The government is to expend $25,000 in improving the telephone system in this city. Address Orrin F. French, chief engineer, department of telephones, Winnipeg, Man., Can.

SNOWFLAKE, MAN., CAN.—The Manitoba Telephone Commission is building a line to connect with Hannah, N. D.

ELECTIONS

PAVILION, N. Y.—The directorate of the Pavilion Telephone Company is composed of Horace Bradley, D. C. Higgins, David Morrow, S. O. Hubbard, Earl Starr and M. A. Christman. The officers are: President, Horace Bradley, vice-president, Earl Starr; secretary and treasurer, D. C. Higgins.

DENNISON, OHIO.—The directorate of the Tuscarawas County Telephone Company is made up as follows: E. R. Van Ostran, Uhrichsville; Theodore Lanning, Dennison; Andrew Deis, Samuel Toomey, C. H. Singluff, Canal Dover; C. H. Goodrich, Sandyville; George Beers, Newcomerstown; John F. Reiser, Tuscarawas; James S. Brailey, Jr., Toledo; John L. Kennedy, Alvin Vinton, Michael Seibold, E. A. Walter, John Kollar, New Philadelphia.

BEREA, W. VA.—The following officers and directors have been elected by the Berea & Slab Telephone Company: J. F. Hatfield, president; John Patton, vice-president; I. F. Knight, secretary; S. C. Phillips, treasurer; Newton Law, general manager; directors, J. C. Patton, S. C. Phillips, E. E. Shimer, A. M. Douglass, Newton Law, G. T. Layfield and I. F. Knight.

MISCELLANEOUS

WYNNE, ARK.—Through a recently consummated deal the local and long distance telephone lines and business of the Wynne Telephone Company, formerly the property of W. B. Fakes, have passed into the possession of the Going Telephone Company, recently organized at Harrisburg. It is understood that the consideration was $7,500, and that the Going Telephone Company is to at once commence extensive repairs and improvements in the system.

COVINGTON, GA.—The plant of the Covington Telephone Company at this city has been purchased by the Southern Bell Telephone & Telegraph Company, and the two systems are to be consolidated at an early date.

NEW ALBANY, IND.—The Eureka and Harrison County Telephone Companies have recently consolidated service in this city, the result being a greatly improved service to the subscribers in Harrison County.

PEMBROKE, KY.—Mr. Frank G. Hoge, president of the Kentucky Independent Telephone Association, announced to an AMERICAN TELEPHONE JOURNAL representative last week that reports received up to date this year from companies enrolled in the association show that the Independent business in the state is going ahead in good shape. The companies are carrying on a successful competition with their rival. Some reports for important towns show at least three times as many Home telephones as those operated by the Bell company.

WILLIAMSBURG, KY.—A fire at this city was responsible for the destruction of the telephone exchange owned by Mr. John Woodward, the loss being estimated at $1,000.

CONSTANTINE, MICH.—The Northern Indiana Telephone Company, which operates exchanges at Constantine and White Pigeon, has disposed of its holdings to the Heinbach Telephone Company.

BOONVILLE, MO.—The property of the Boonville Telephone Company has passed into the possession of L. F. Coulter and J. W. Watson, of Bevier, Mo. The Boonville Company is capitalized at $60,000, operates over 700 telephones in Boonville, is connected with 2500 telephones in Cooper County and gives its long distance service over the lines of the Kinloch Telephone Company. The retiring stockholders of the company are: J. F. Gmelich, Col. John S. Elliott, C. A. Sombard, Charles Meirhoffer, J. E. Thro, R. L. Steigleder, E. W. Chilton, H. M. Taliaferro, of Boonville; John Brokmeyer, of Elden, and Iva Butterfield, of Knobnoster, Mo.

SEDALIA, MO.—The name of the Independent company recently organized at this city is the Sedalia Home Telephone Company. It has taken over the property of the Queen City Telephone Company, and proposes to extend and improve the system.

ROCHESTER, N. Y.—The Lakeside Telephone Company's franchise and equipment have been sold on a foreslosure action brought by the Rochester Trust Company for the bondholders, the purchaser being Hart Lincoln, of Buffalo, who, it is understood, acted on behalf of the Inter-Ocean Telephone Company, the consideration being $15,300. The Lakeside line was built originally by a Lyndonville Company, and operated in the northern towns of Niagara and Orleans counties. Over $100,000 cash has been invested in the plant, and bonds for $40,000 have been issued and sold.

SALISBURY, N. C.—Arrangements have been concluded whereby the Lower Stone Telephone Company of this city and the Southern Bell Telephone & Telegraph Company have merged their interests, and the exchange at Salisbury will in the future be under the control of the Bell Company.

COLUMBUS, OHIO.—Owing to the fact that the plants of the Clermont County Telephone Company at Bethel and Williamsburg have been sold to other companies, Receiver B. W. Gillfillan is able to pay a dividend of about 20 per cent to creditors, and this is to be done at once. The plants at Milford and Loveland will be taken over by new companies within a short time, and it is believed that the money thus received will be sufficient to pay all the debts and leave something to the stockholders. All the plants of this company are being taken over by smaller Independent companies organized for the purpose.

COOPERSBURG, PA.—The plant of the Coopersburg Rural Telephone Company has become the property of W. H. Steininger, the consideration being $400.

SIOUX FALLS, S. D.—Under a decree of foreclosure filed by Judge Carland, of the United States Court, in this city, in the case of the Royal Trust Company and H. E. Ambler, of New York, vs. the Citizens' Telephone Company, of Sioux Falls, it is ordered that unless the telephone company shall on or before Aug 20 pay the plaintiffs the sum due on the mortgage, $210,772.90, the mortgaged premises shall be sold; that if default be made in the payment by Aug. 20, the property shall be sold as an entirety, and without an appraisement or right of redemption, at public auction to the highest bidder for cash, subject to the provisions of the decree as to payments. No bid less than $50,000 is to be accepted.

PUYALLUP, WASH.—The principal place of business of the Puyallup Valley Telephone Company, notice of whose incorporation was recently given at Tacoma, is to be Puyallup.

REGINA, SASK., CAN.—In addition to the new companies of whose organization mention has been made recently, local telephone companies are to be formed at the following places: Balgonie, Hanley, Swift Current Town, Maple Creek, town of Melford, town of Saltcoats, Wamsley, Sedley, Rouleau, Estevan, Briercrest, Weyburn, New Osgoode, Elmore, Esterhazy, Condie, Wadena, Wilcox, Aberdeen and McTaggart.

UNDERGROUND

PETALUMA, CAL.—It is the intention of the Pacific Telephone & Telegraph Company to place all wires in the business district of Petaluma underground.

LAURIUM, MICH.—As a result of a decision arrived at during a recent meeting of the City Council, all wires in the business section of Laurium must be placed in conduits.

MUSKEGON, MICH.—Permission having recently been granted to the Citizens' Telephone Company to install a conduit system in this city, work is to be commenced at once.

MINNEAPOLIS, MINN.—A resolution instructing the Northwestern Telephone Exchange Company to place its wires in conduits in certain sections of this city was recently favorably passed upon by the city council.

LINCOLN, NEB.—The Lincoln Telephone Company is placing some of its wires underground in Lincoln.

JERSEY CITY, N. J.—Considerable conduit work is being done by the New York & New Jersey Telephone Company in Jersey City.

SCHUYLKILL HAVEN, PA.—The Bell Telephone Company of Pennsylvania, which is installing a new exchange in this city, expects to place a number of its wires underground.

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The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.

HELP WANTED

The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—A number of first-class experienced telephone solicitors; give reference and state salary expected. NATIONAL TELEPHONE COMPANY, G. M. Dept., Wheeling, W. Va. 1156

POSITIONS WANTED

The rate for "Positions Wanted" advertisements of 25 words or less is 50 cts. an insertion; additional words 1 ct. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

A TELEPHONE man with 11 years' experience in equipment, traffic and commercial departments with one company, would like to make a change. Present position manager central energy plant of 2250 subscribers. Best of references. Address No. 1153, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

WANTED.—Permanent position, by competent young man, experienced as manager; capable of handling the business, as well as the electrical end. Eight years' experience: good habits; best reference furnished. Address No. 1154, care of AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION WANTED as instrument or switchboard man with operating telephone company; six years' experience; technical education; correct habits; references; Middle West preferred. Address Box 1157, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

POSITION wanted by first-class cable splicer, who will take charge and keep your cables in first-class shape; state salary when writing. Address Box 1158, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

AN all-around telephone man with 10 years' experience wishes position as manager or superintendent of an exchange; A1 on cable construction; married; any location. Address Box 1159, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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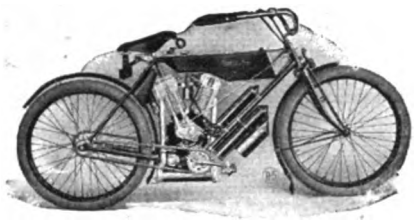

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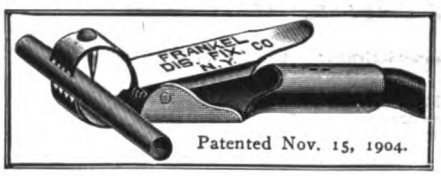

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For connecting bridging 'phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.

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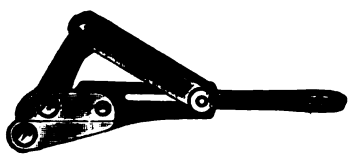

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DESIGNED BY PRACTICAL MEN

The Sky Rocket Arrester

Made for practical work, and they do it right. Their mission is to protect your lines from charges of excessive potential whether due to lightning or other causes, and they fulfill this mission invariably and infallibly.
Details, prices and references await your inquiry.

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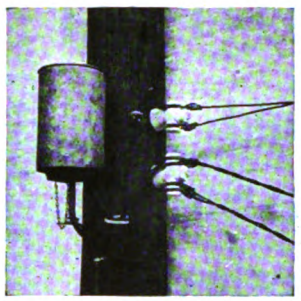
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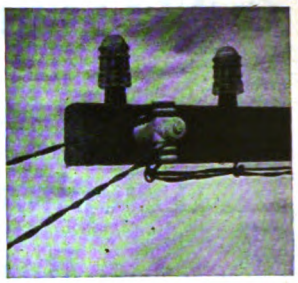
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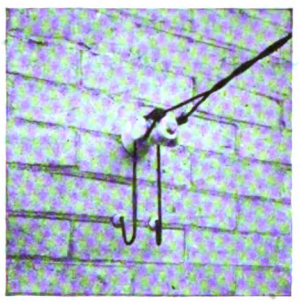
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They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
Grooves for any direction—Universal,
All porcelain—No rot or rust and very neat.
Cheap to erect; cheaper to maintain.
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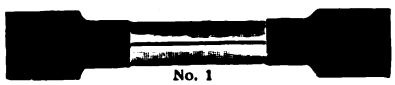
SEEN AT A GLANCE THRO. THE GLASS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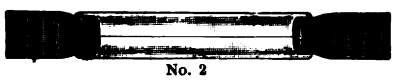
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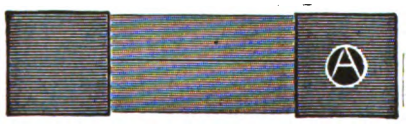
THE "VERIBEST" FUSE (PATENTED)
The Most Perfect Fuse Made. The Wire is protected throughout. A Glass Enclosed Fuse.

PRICE $1.25 PER HUNDRED



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Copper Term., $1.25 per 100
Foil Term. 1.00 per 100

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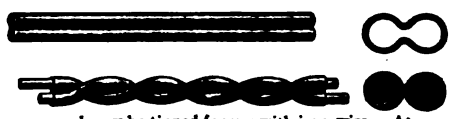
SEYMOUR, CONN
GERMAN SILVER
RESISTANCE SHEET AND WIRE
COPPER WIRE
BRASS, BRONZE AND COPPER

H.-C. Seamless Tubular Wire Connectors



make a perfect self-welding joint. They are seamless and are drawn up from sheet copper and may be tinned for use with iron wire. Atmospheric conditions cannot impair their efficiency. Write for price lists.
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Insulated Staples
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4 Sizes
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TUBE FLUX for SOLDERING
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COMPRESSED CLEATS FOR USE ON PLASTERING

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WIRE ROPE
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Registered Trade Mark

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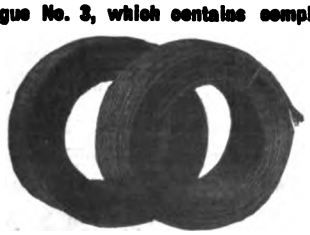

Made with any number of Conductors and cut to lengths and tipped if desired.

Send us samples or specifications of special cordage and we will quote prices.

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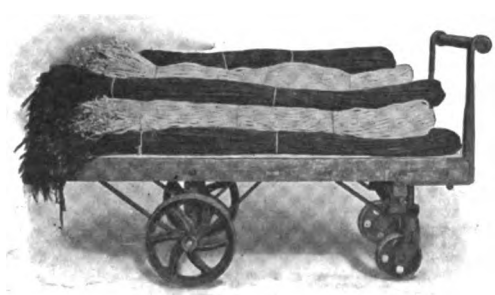
STROMBERG CARLSON
Registered Trade Mark

QUALITY
SWITCHBOARD CORDS



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THEY WEAR WELL—BETTER THAN OTHERS

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SUCCESSOR TO

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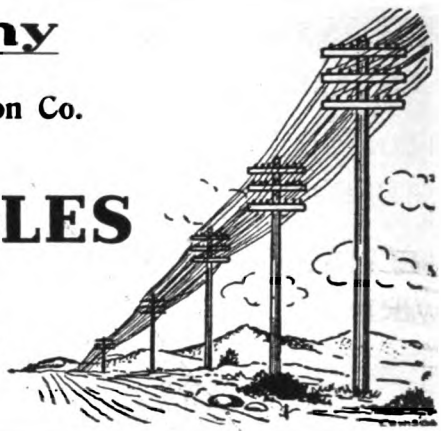
LARGE STOCKS OF POLES

Yards from Maine to Washington



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ERNEST L. CLARK, President

Michigan Western } Cedar Poles Exclusively

All stock concentrated in our main yards

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Michigan Cedar POLES

Our yards are so located we can ship stock to any point in the United States. Stock is cut from the choicest timber remaining in Northern Michigan.

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DOTY LUMBER AND SHINGLE CO.

Manufacturers of

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Cross Arms. Red
Cedar Poles and Piling.
In any length.

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WHEN YOU PLACE AN ORDER FOR

BISSELL IDAHO and MICHIGAN **CEDAR POLES**

You not only secure the highest quality obtainable, but extremely low prices too.

It pays to write. Just ask for Leaflet Three.

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Prompt Shipment Best Grade

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POLES

Northern White Cedar

Give best service. Our prices are lowest.
May we quote?

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LARGE STOCK 14 TO 65 FT.
—PROMPT SHIPMENT—

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Idaho Red Cedar Poles Our Specialty

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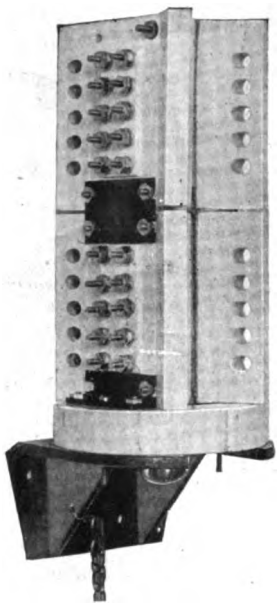
AN ALL PORCELAIN CABLE TERMINAL

(Type DP)



Price Very Low

Send for Sample

AMERICAN ELECTRIC FUSE CO.

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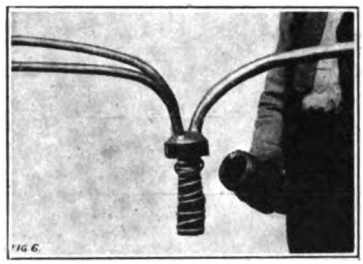
Patented Oct. 17, 1905



Hargis Patent No. 802,337

TROUBLE!!

When you have found that the trouble in your cable is at or near a certain joint, it is not necessary to blow the joint or cut the sleeve when you use MATTHEWS' CABLE SPLICING JOINTS. All that you have to do is to take your spanner wrenches and unscrew the pot from the soldered top. Then you can unlace the pairs and spread them out like a fan so that it will be easier to get at them for a test. When the bad pairs are found the trouble can be fixed and it is a simple matter to screw the pot back in place.

Compare the above simple and inexpensive procedure with what you would have to do with a horizontal joint with two wiped ends. You would have to "blow" the joint open or cut a seam. Then you would have to dig through the pairs until you found those that were troublesome. After you find the trouble you must practically make the joint over again. If you have to change your distribution in the future, this must also be done.

MATTHEWS' CABLE JOINTS PREVENT TROUBLE

W. N. Matthews & Brother

Manufacturers of
Matthews' Patented Money Saving Specialties.

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Buy from the Producers and Save Jobbers' Profits

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LARGE LOTS of LONG POLES

Well Seasoned White Cedar

Immediate Shipment

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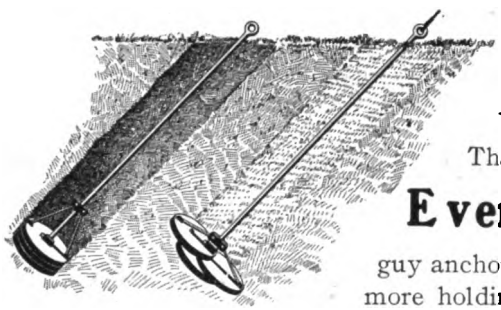
General Office: 919 Lumber Exchange, Minneapolis



Price DOWN--Efficiency UP. That's the

Everstick

guy anchor. It has more holding surface than any other, and is sold at a lower price.

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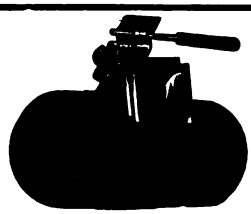
White Cedar **POLES** Longest Lasting Best Grade

OUR NEW STOCK COMING IN. 100,000 TO 150,000.
26 YEARS HAVE WE BEEN PRODUCING POLES.
WRITE US.

Yards: Omer, Bay City and Boyne Falls. W. C. Sterling & Son Co., Monroe, Mich.



M. & B. Ground Clamp

Patent applied for.

For connecting telephone ground wires to lead or iron pipes. Simple in construction; easy to adjust; fits any size pipe. Remains tight whether pipe expands or contracts. No loose connections when our clamp is used. Write us for samples and prices. Milwaukee Electrical Specialties Co., Box 393 Milwaukee, Wis.

POLES AND PILING Chestnut, Red Cedar and Cypress Lengths 16 to 65 feet

J. P. MEREDITH CEDAR CO., Memphis, Tenn.

POLES 20 and 25 foot lengths for rural telephone lines a specialty.

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(Established 1881)

Manufacturers and Dealers in

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Conduits for Underground Wires and Cables, Cross Arms, Poles, Guy Blocks and Lumber.

Wood treated by our dead oil of coal tar process will never decay.

OFFICE: 50 Church St., N. Y. City. WORKS: Portsmouth, Va.

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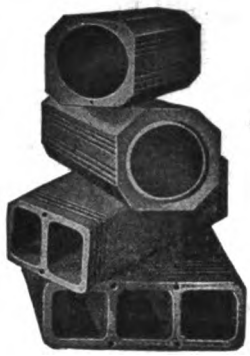

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CLAY CONDUIT

SINGLE and MULTIPLE DUCT

IMMEDIATE DELIVERY ON ALL STANDARD SIZES

Factories: New Jersey, Pennsylvania, Ohio

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American Telephone Journal

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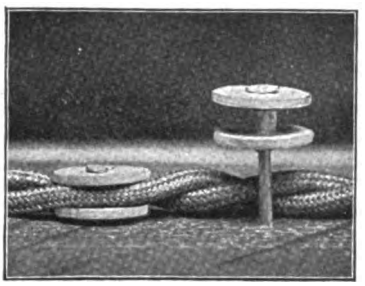
EUREKA FIBRE INSULATORS

A NEW STYLE

"PRICES TO POINT, WHERE IT IS ECONOMY TO USE THEM"

The value is in the method that they are attached without injury to the wire.



Made in Three Types
50, 60, 70
¾", ⅞" and 1" long, respectively.

PRICES AND SAMPLES ON APPLICATION

COMMERCIAL ELECTRICAL SUPPLY CO.

Fifteenth and Pine Sts. **ST. LOUIS, MO.**

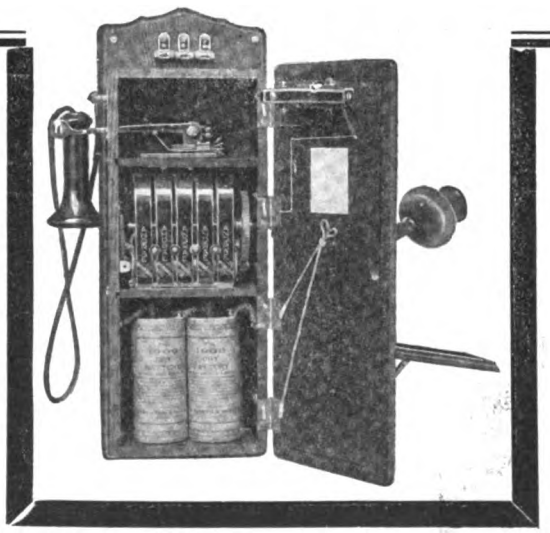
IT ALL DEPENDS ON THE DATE

This Telephone Stands No Show

if you compare prices the first day or the first month or the first year.

Most any instrument costs less in the first place.

But



After the First Year

it begins to shine. And year after year as you figure the repair bills and livery bills on the telephones that cost less; and find no expenses on this one. You see wherein

Kwality Kownts

like many other good things, the **Andrae Giant** improves with age, and the older it gets the better it gets. At the end of 5 years it is the cheapest telephone on the market. If you will look inside an Andrae Transmitter you will see the finest piece of workmanship ever put in a telephone. ¶ **We are looking for critics.** If you are an experienced telephone man we want your opinion of the Andrae Giant and want to send you one to examine. ***Write us to-day.***

Julius Andrae & Sons Co., 48 Years In Business Milwaukee, U. S. A.

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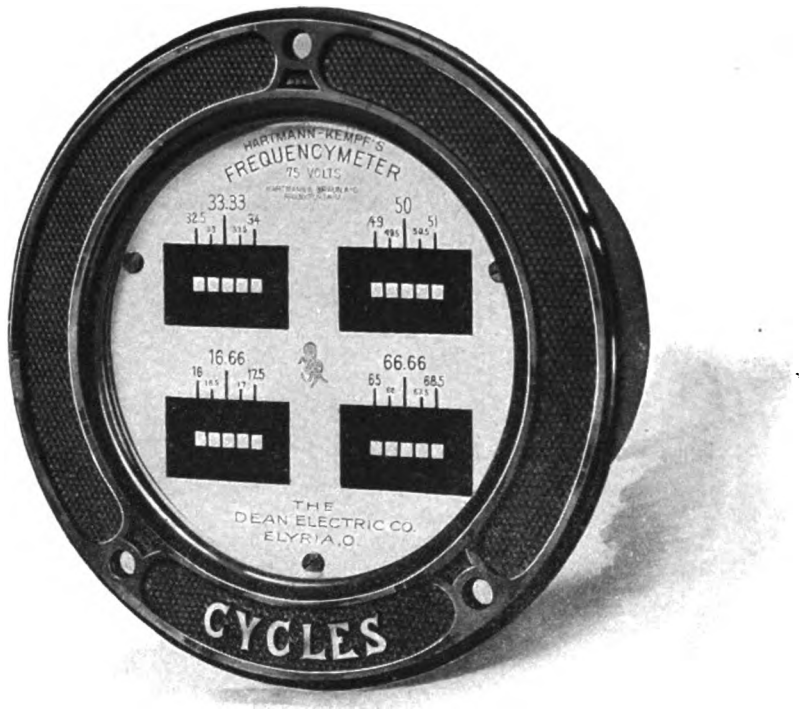

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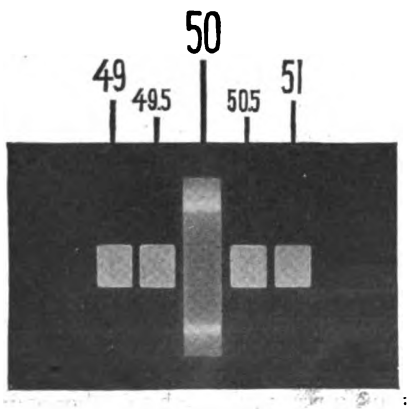
¶ **The "Dean" Harmonic System** is still the only successful party line selective ringing apparatus in the world.

¶ **Absolutely no Failures** is the "Dean" record since the introduction of our Harmonic Converter (registered trade-mark) and our Harmonic telephones.

¶ **No Working Installations** can be shown by some of the makers of imitating appliances—hence the long list of "Dean" successes is abundant proof of superiority.

¶ **Even the Slightest** uncertainty is now eliminated —"Dean" selective ringing is an exact science through the use of the



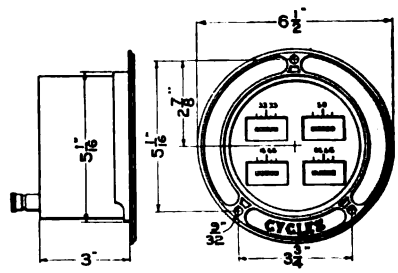
Hartmann-Kempf Frequency Meter.

¶ **With this Instrument** the number of cycles per second may be readily determined—the reading is instantaneous.

¶ **Plain Readings** are indicated by the reeds which vibrate as illustrated. Each of these reeds is a separate unit, even if one should be broken, the efficiency of the others would not be impaired.

¶ **Their Permanency** has been proven by three years' continuous vibration before the invention was marketed.

¶ **Hartmann-Braun A. G.,** the manufacturers, of Frankfort a/M, Germany, have made us the American sales agents for this special instrument.



¶ **The Exact Dimensions** are shown in this drawing. The meter may be mounted in a portable case, or on a suitable mounting board above your power panel; or, it may be specified for any new "Dean" board.

¶ Send for Dean Folder No. 15.

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

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Generator Call Wall Telephone

CENTRAL ENERGY STYLE

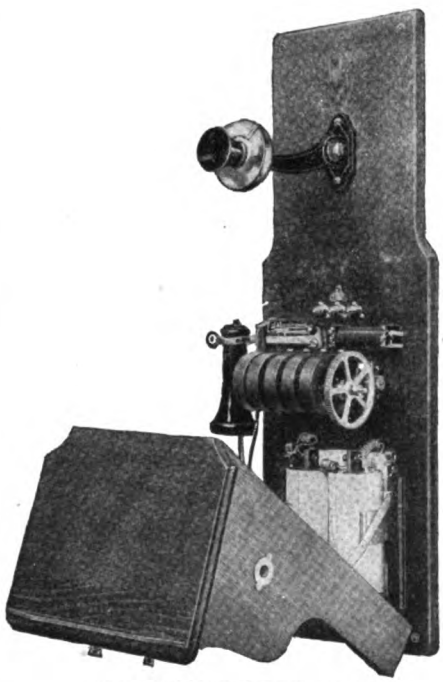
¶ **Accessibility** is best manifested in our **Central Energy Style Telephone** because all the apparatus is conveniently assembled on the backboard—except the ringer.

¶ The construction of the telephone box and backboard provides the real feature of **accessibility** in this type of telephone—the equipment being the same as furnished with our several forms of Magneto Telephones.

¶ Unfasten the screw-lock from front of telephone and **the entire box** hinges from the bottom, exposing the complete contents, as effectively shown in our illustration. To be able to approach the entire equipment without interference by the woodwork construction—**is real accessibility.**

STROMBERG-CARLSON CABINETS

¶ You will be safe in buying "Stromberg-Carlson" telephone woodwork merely on its appearance, but we don't ask you to do this—**we guarantee to deliver to you cabinets that we know will outwear and outlast all others.** ¶ **Firstly**—we know the quality of material cannot be improved. ¶ **Secondly**—that our cabinets are perfectly adapted to the purpose for which they are used. ¶ We offer you the best obtainable—it is economical to buy the best always.



No. 716 Telephone

STROMBERG-CARLSON APPARATUS

¶ First of all you should become thoroughly acquainted with "Stromberg-Carlson" Magneto Apparatus. ¶ Our No. 7 TRANSMITTER is earning a higher position daily—are you interested enough to write? ¶ The creditable fact is that it excels under all tests where others fail. ¶ Is perfect transmission worth anything to you? ¶ Equally efficient are all other parts of Stromberg-Carlson Magneto Apparatus.

OTHER FEATURES

¶ In mounting all the apparatus on the backboard—the line binding posts have been taken within the space covered by the telephone box—simplifying as well as greatly improving the general appearance. A partition in the box comes between the generator and top of the batteries, forming a separate yet ventilated compartment for the batteries.

¶ There is plenty of room for installing the "Sure Ring" Condenser and "Push Button Key" which are furnished with any standard Series or Bridging equipment in this style of telephone woodwork.

¶ Further information and prices contained in our Phamphlet No. 1, mailed upon request.

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ROCHESTER, N.Y.-CHICAGO, ILL.

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"Waiting Action of Bell Company"

That notation opposite several companies' names on our prospect list, spells inaction. It also calls to mind the Fable of the Tortoise and the Hare. Do you remember that the hare thought himself such a Live Proposition that after running part of the race, he could safely lie down and snooze till the Tortoise caught up to him and then beat the Slow Guy by a couple of hops? But he overslept and the Tortoise plodded by and won.

The Independent Company

that has made a part of the race and then deceives itself into the belief that it can lie dormant "waiting action of the Bell Company" is liable to wake up and find the race lost.

Just remember

that you can't afford to stop running in the race for business. Keep your plant at the top notch of efficiency all the time and don't wait to make improvements till your competitors force you to. Force them, don't let them force you.

Buy Automatic now

and keep ahead of your competitor. Don't wait to see what your competitor is going to do. Improve now and with Automatic.

Our Automatic System has been adopted in the following cities:

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Akron, Ohio.
Allentown, Pa.
Auburn, Maine.
Auburn, N. Y.
Battle Creek, Mich.
Beaver Falls, Pa.
Bellingham, Wash.
Berkeley, Cal.
Billings, Mont.
Butte, Mont.
Cadillac, Mich.
Champaign, Ill.
Chicago, Ill.
Cleburne, Texas.
Columbus, Ga.
Columbus, Ohio.
Dayton, Ohio.
Decatur, Ill.
Dowagiac, Mich.
Edmonton, Alberta, Can.
El Paso, Texas.
Emaus, Pa.
Fall River, Mass.
Grand Rapids, Mich.
Hastings, Neb.
Havana, Cuba.
Hazelton, Pa.
Holland, Mich.
Hopkinsville, Ky.
Houston, Texas.
Jonesboro, Ark.
Kenton, Ohio.
Lake Beaton, Minn.
Lansing, Mich.
Lewiston, Maine.
Lincoln, Neb.
Los Angeles, Cal.
Manchester, Iowa.
Marianao, Cuba.
Medford, Wis.
Mount Olive, Ill.
New Bedford, Mass.
Norfolk, Neb.
Oakland, Cal.
Ocean Park, Cal.
Omaha, Neb.
Pontiac, Ill.
Portland, Maine.
Portland, Ore.
Princeton, N. J.
Richmond, Ind.
Riverside, Cal.
Rochester, Pa.
Rushville, Ind.
San Diego, Cal.
San Francisco, Cal.
Santa Monica, Cal.
Saskatoon, Sask., Can.
Sioux City, Iowa.
South Bend, Ind.
Spokane, Wash.
St. Marys, Ohio.
Strathcona, Alberta, Can.
Tacoma, Wash.
Toronto Junction, Can.
Traverse City, Mich.
Urbana, Ill.
Van Wert, Ohio.
Wausau, Wis.
Westerly, R. I.
Wilmington, Del.
Woodstock, N. B., Can.

Automatic Electric Company

Van Buren and Morgan Streets, CHICAGO, U. S. A.

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"ROBERTS" AND WHAT IT MEANS

12 The Roberts System offers the following strong advantages: Selective Ringing, Private Service, Complete Automatic Supervision, No Interference, Best of Transmission, No Need to Signal Twice, Impartial Service, Emergency Signal, Operator Controls the Line, Trouble Located by the Operator, Ideal Toll Line Service on Party Lines, and vice versa, Reduced Costs, Increased Revenues, Etc., and adaptability to any existing local battery exchange.

Remodeling Old Plants

The Roberts Party Line System may be wired into any type of local battery switchboard, and into local battery instruments of standard design. For use on individual lines, in connection with the Roberts Party Line System, old 'phones may be rewired at trifling cost to conform to the Roberts circuits. Old plants can be converted to the Roberts System gradually and without interruption of service—the system may be wired into the switchboard and the lines converted when convenient. Or we can furnish a switchboard that will take care of your old lines and be ready for the Roberts System when you are. You can also retain the old board and old lines, and simply add a new position or section for new business to be handled by the Roberts System. Remember, too, that any of these changes will more than pay you in dollars and cents, to say nothing of the superior service and satisfied patrons.

Our bulletins tell all about it. Write for them.

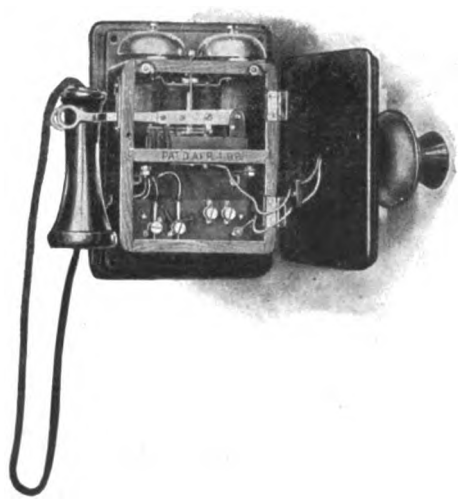
HOMER ROBERTS TELEPHONE CO.
1700 Melrose St. Chicago

Private Branch Exchange Eqnipment

Our common battery lamp boards are equipped with the well-known Monarch relays —the most compact, convenient and reliable relays produced.

Our common battery visual boards are equipped with the Monarch visual signals which—like the relays—have the Monarch characteristic—accessibility—strongly in evidence. Owing to the ingenious design they are extremely sensitive and positive in operation.

The hotel and residence type wall sets have the removable shelf feature which makes the Monarch telephones so accessible.



Because of **the simplicity and reliability of Monarch apparatus, for private branch work it has no equal. Write for a catalogue.**

MONARCH TELEPHONE MANUFACTURING CO.

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FEATURES

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Baird Pay Stations are by far superior to any other on the market.

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Baird Manufacturing Co.

1590 North Halsted St. CHICAGO

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as an addition to party-line service, you are wrong.
It is not something added—it is a feature which has always belonged to good service. It unfailingly gives absolute

Secrecy

to any of the parties on the line. It gives the subscriber all the advantages of a private line at the cost of a party line. It enables you to put more parties on a line, and get higher rates.
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All details are in Catalog No. 50. Write for a copy.

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Samples FORTY CENTS, Prepaid

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SCHWARZE ELECTRIC COMPANY

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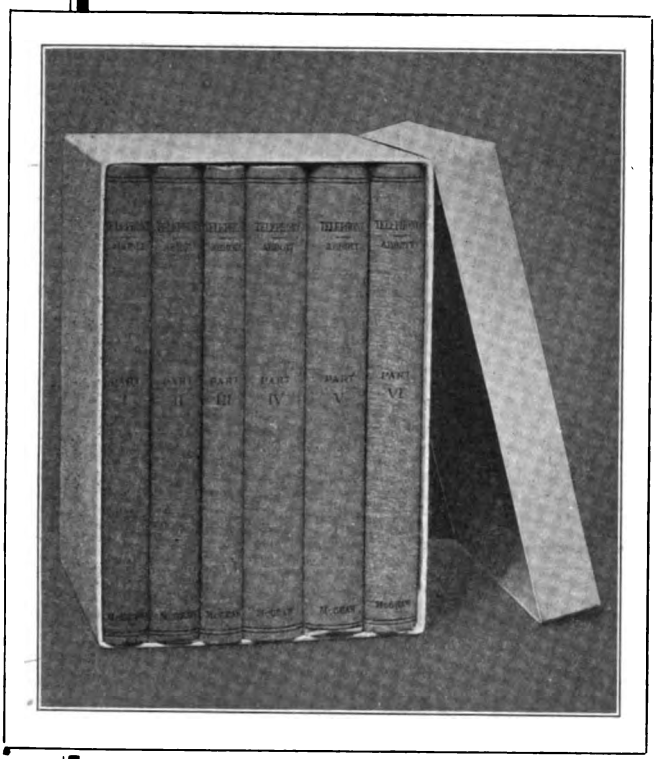
TELEPHONY



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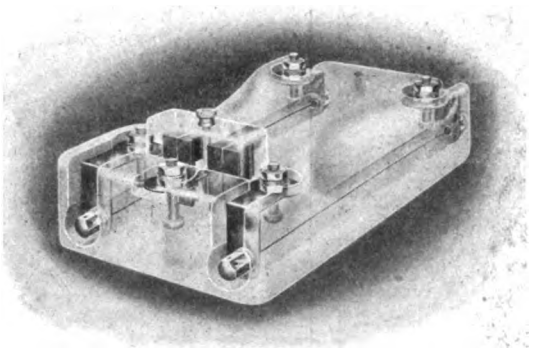

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In the hollow of the cord at the plug end, there's a reinforcing spring made of the highest grade spring steel. Not only does this prevent the conductors from being thrown out of alignment, but it also makes it practically impossible to break the cord at the plug end, and that's where the strain is greatest. Operators don't have to be careful when you use Premier Steel Cord—it'll last in spite of shamefully careless usage. Better get details.

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It stands 500 volts permanently, 1000 volts momentarily, and can readily be made tor higher voltages. Small, light and inexpensive.

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Applications for license to manufacture should be addressed to the Patentee.

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American Telephone Journal

(WITH WHICH IS INCORPORATED SOUND WAVES)

VOL. XVIII. NEW YORK, SATURDAY, AUGUST 29, 1908. No. 9.

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Telephony, the New Paper

Mr. Fred S. Kenfield, the new owner of the AMERICAN TELEPHONE JOURNAL, takes pleasure in informing its readers that he has made an arrangement whereby this publication will be consolidated with *Telephony*. The combination provides the telephone field with one great medium of communication with an excellence of facilities and completeness of circulation which is commensurate with the importance of the industry for the continued upbuilding of which it will exert its influence. The new paper will be known as *Telephony*, with which is incorporated the AMERICAN TELEPHONE JOURNAL, SOUND WAVES, the TELEPHONE and the TELEPHONE MAGAZINE. It will, according to present plans, embody all of the excellent features which these old-established publications have heretofore enjoyed separately, togther with many new and important additions. It will be published at Chicago, the recognized center of the telephone field.

The publisher believes that the new consolidated journal will possess one of the finest organizations of any trade publication in the world, capable of furnishing its readers and patrons with the best possible service. During the past few years while the AMERICAN TELEPHONE JOURNAL and *Telephony* have been active competitors, each has built up a subscription list and advertising patronage of which any publication might well be proud, and each has contributed materially to the progress and welfare of the telephone industry.

The publisher also believes that all telephone men appreciate that this consolidation presents not only the correct commercial solution of an interesting problem, but one which will prove to be of the greatest benefit to all those who have supported and profited by the work of the two papers, producing, as it will, one strong weekly publication which will be a creditable and useful representative of the telephone industry.

The new publication will be reliable, aggressive and up to date in every particular, and it is believed that it will receive the support and good will of telephone men generally.

Mr. Franklin H. Reed, who for a number of years has edited the AMERICAN TELEPHONE JOURNAL, will be the editor of the new *Telephony*.

The plan and scope of the new publication will be set forth at greater length in its first issue, which will appear Sept. 5.

Customs and Telephone Advance

For every custom which men follow there is a reason. Back through the years, experience has been at work developing the methods by which we work and think. The first electricians, dealing with relatively low voltages, did not appreciate the full value of insulation. The sensitiveness of the telephone soon taught men that, though the voltage is low, high insulation is essential to good work.

The slackness of the drop line from pole to house is born of

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information to be put on operating room record cards must be governed by the size of the exchange and local conditions. For example, it is the custom in small exchanges to keep a record of the opening and closing time of a store to verify a "don't answer" report. By some traffic men it is deemed better to have the operator or "Information" simply say, "They don't answer," after ringing the required number of times. The latter method would seem preferable, as it is the telephone company's business to make the connection and ring the subscribers, day or night, weekday or holiday, and not to inform the public that a certain store is closed. While it might show on toll work why the call was a "lost call," and was so through no operating fault, its advantage even on such a call is questionable. "They don't answer" is usually the last word on the subject.

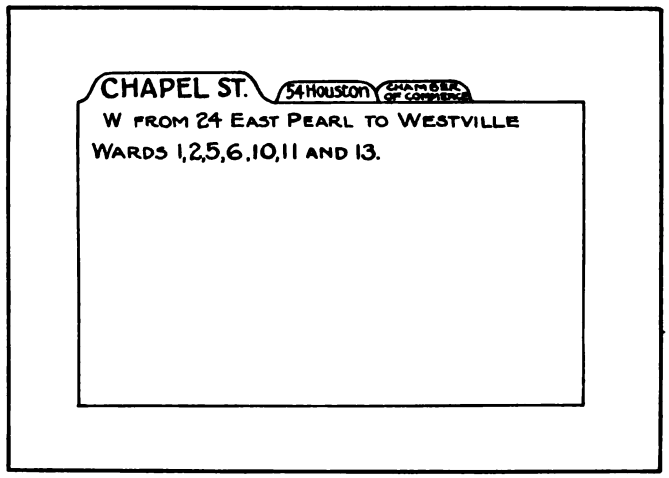


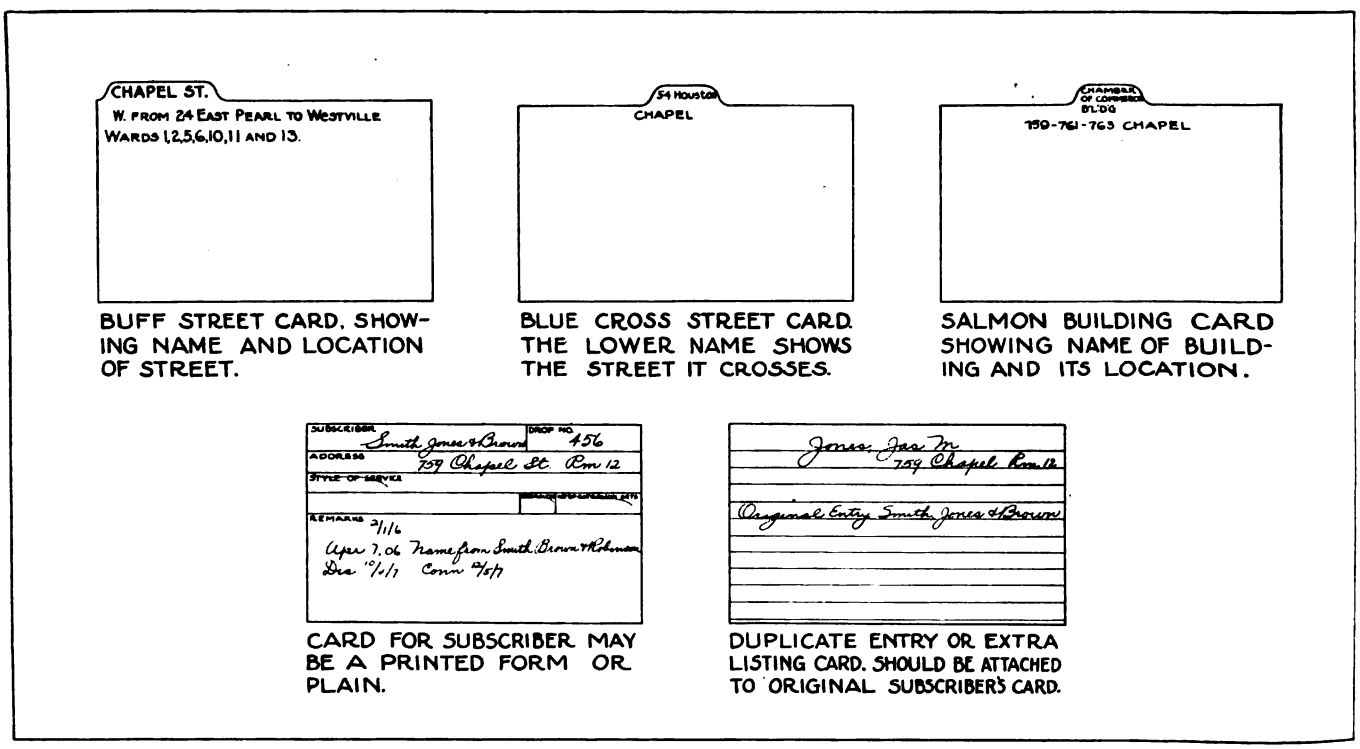
Fig. 1.—Arrangement of Guide Cards for the Street List.

If there is a duplicate entry under the subscriber's name, there should be an extra listing card, as in the circuit record, fastened to it by a clip or eyelet. In the example shown with this article the subscriber's card is Smith, Jones & Brown, address 759 Chapel Street, room 12. The building card shows that the subscriber is in the Chamber of Commerce Building. The telephone was connected February 1, 1908. On April 7, 1906, the name was changed from Smith, Brown & Robinson; the instrument was disconnected October 4, 1907, and reconnected December 5, 1907. Attached to this card is a duplicate entry card, showing that Jas. M. Jones has an entry in the directory under the same number. The writer is of the opinion, however, that in the large operating room these dates are of little value. Names, addresses and telephone numbers supply all the information required.

The street list is very useful in offices having as small a number as 500 stations. Here it becomes a part of the wire chief's record, and should combine with addresses the cable conductor numbers of the line, the terminal point from which the station is served, the cable number, and the class of service the subscriber receives. This information will help the wire chief materially in assigning party line numbers, and locating cable conductor numbers in terminals from which to run new service wires.

Townships surrounding the city in which the main exchange is located, having no street numbers, may have tab cards with the name of the town on them, behind which the subscribers' cards may be arranged alphabetically. Maps of the city, county and state are useful in connection with such a record, and may be readily found when needed if they are folded and pasted to a tab card upon which is printed the name of the map.

At the end of the street list a place should be provided for "dead" cards, or those of subscribers whose telephones have been taken out during the time that the current directory is in force. These may be arranged numerically for reference by number or alphabetically for reference by name, and are useful in a variety of ways. They can be used in checking the directory, in making up bulletins for the "A" board, if these are used, and for verifying other records, such as those of "outs," etc. Upon issue of a new directory they may be bundled up, marked and filed away until the time arises for their destruction. Such a record will enable "Information" to perhaps answer questions like the following, which are actual questions and show the state of mind of some of the people with whom the operators must deal, and the necessity of having



Various Cards Used in Connection with the Operating Room System List.

the records described above, in order to satisfy the calling party.

"Tell me the name of the people who live at 175 Chestnut Street."

"Give me the number of the last grocery store out State Street."

"What is the number of the Italian fruit store on Broadway?"

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"Is there any one in Mrs. Adams's boarding house on North Street who has a telephone? Don't know the street number."

"I want a man. I don't know his name, but he has a telephone in the block this side of Music Hall. He runs a fruit stand."

"Give me the number of the telephone in a grocery store on Winter Street."

"Tell me what dentists are in the building with Dr. Smith, who is somewhere on Main Street."

"There is a woman living on Main Street, near Criss Street, I don't know her name or street number, but give me the number of the nearest telephone to her." (We fear that this demand could hardly be supplied.)

Messenger Ready to Carry Drawer from Street List to Chief Operator or Information. The Whole Drawer is Taken to Avoid Misplacing or Losing a Card.

"Look up the name of some telephone on Columbus Avenue. It begins with R. I don't know the name."

"Can you give me a musician on East Avenue, near Day Street, Northville?"

"Is there a telephone in a store next to John Smith's on East Avenue? What is the number of it?"

Collections an Indication of Prosperity

Mr. Hart W. Farwell, secretary and general manager of the Citizens' Telephone Company, of Terre Haute, Ind., spoke recently regarding prosperity in Terre Haute. "Collectors, such as we have," said he, "who go from door to door when the quarterly telephone rentals are due, get a clearer insight into actual financial conditions of the individual than is obtained by anyone else. Ready money on the part of the householder means good times and prosperity, and our collectors certainly have found plenty of money. In very few instances were they invited to return next day or next week. Almost all presentations of bills were followed by immediate payment.

"Our quarterly collections, which were made during July, were the best collections we have had since the Citizens' company was established. Further than that, we are getting more telephone orders than ever before, and our plant, new as it is, is taxed to its capacity. In my opinion, hard times, if they every struck Terre Haute, let go in very short order."

Advantages of Measured Service System of Charging

The National Telephone Company has been conducting an educational campaign of exceptional interest in connection with the introduction of the measured service system of charging in England. Employees of the company all along the line have been encouraged to study the questions involved, and thus prepare themselves to assist in the work of enlisting the approval of subscribers, a task which is being accomplished in the face of numerous obstacles.

Essays were submitted some time ago by employees of the company in competition for a prize on the best statement on "The New Measured Rates." The prize-winning essay, by John Craven, of Glasgow, which has been published in the *National Telephone Journal,* contains statements on the advantages of the new system, and objections to the old flat rates, as follows:

1st. Unremunerative Unlimited Rate.—The unlimited rates were fixed for a system which embraced a small number of telephones. The number has since then multiplied many times, and the value of the service has, therefore, been vastly increased to every patron. When the number of telephones was small the average number of calls per telephone was also small; while now, with a large number of telephones on the system, the average number of calls per telephone has greatly increased. Consequently the expense of handling the business has also increased. It is surely reasonable, nay, imperative, that the increment of value given to the unlimited subscribers by these additions every week be charged for.

2. Ineffective Calls.—The proportion of ineffective calls is a great source of trouble and expense. Indeed, they have long presented a problem which has only now to a certain extent been solved by the advent of the new measured rates. The provision of auxiliary lines and trunk lines to branch exchanges for a small rental is a feature of these new rates which, from want of thought and indifference, subscribers are slow in grasping. Were it possible to get the value in money of the business represented by these ineffective calls which have been lost to a particular subscriber, and to point out the rival houses to which that business went, the trouble would soon be over; but these particulars, as can well be understood, can hardly be procured. When the difficulty is explained in a general way, the large unlimited subscriber immediately declares that these ineffective calls would be of a trivial nature, so accustomed is he to answering calls which are but "airy nothings." As a rule, therefore, the unlimited subscribers dislocate the traffic and increase the work and expense of operating.

3. The New Measured Rate Calls Are Graded to Benefit the Large User.—We may come across the owner of a business upon whose mind the injustice and the delusive advantages of the unlimited rates have made an impression, but although he has become disillusioned, he naturally enough considers that he should not be expected to pay as much per call as the small trader. The charges meet his case exactly. The man who contracts for a direct line at £5 for 500 calls pays 2¼*d* per call. If he decides to take 1500 calls he pays £8 10*s* per year, which works out as 1¼*d* per call, and he only pays 1*d* each for excess calls, as against 2*d* per excess call levied on those who contract for a smaller number than 1500.

If the agreement covers a small private branch the difference is the same, taking these two rates; if the contract is on the large private exchange basis the ratio of gain is as great. The rate for 3000 calls is £8, while 9000 calls are charged, not £24, but £20. The prices of internal extensions on large private branch exchanges are also fixed to benefit those who take a large number; for instance, up to 10, 32*s* each; from 40 to 60, 24*s*; over 100, 20*s*.

4. Refunds.—Those who contract for a number of calls

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above the minimum and do not use them get a rebate in cash, or might we not call it a bonus, at the end of the year. The minimum number of calls is 500 and to get the benefit of the 1*d* charge for excess calls, if they should be required, as already mentioned, it is necessary to contract for 1500 or over this number. There is a strong inducement and a great benefit given here by the company. A man signs an agreement with sufficient calls to carry him through a busy, prosperous year. If business has been brisk, he feels the advantage of having contracted for a good supply of calls; if, unfortunately, business turns out poor he loses nothing by his telephone, for the telephone company comes to his aid and gives him back the equivalent in cash of the unusued calls above the minimum.

5. *The New System Provides for an Effective Service.*—Measured-rate subscribers get quality (if we can apply that word to the telephone message) as against the quantity given to the unlimited patron. Of course, we do not mean to say that the unlimited subscriber is deliberately starved; he gets as good service as ever he got, but the measured-rate subscriber gets better. As every measured call which does not get through is a loss to the company, the operator keeps in touch with the caller until he gets the connection.

6. *The Old System Encourages Dallying at the Instrument.*—"Ill habits gather by unseen degrees." In nearly every large establishment which has telephones on the unlimited basis, the employees go to them as they would the water tap and do not spare them or their own time. They have gradually got accustomed to do this, and know that the employer imagines that when they are at the telephone they must be giving or getting some message which will help business. Could an articulate echo of the message reach the chief's ears he would suddenly become a strong supporter of the measured rates.

History of the Automatic Telephone*

By Arthur Bessey Smith, *Purdue University.*

In the summer of 1896, A. E. Keith, John and Charles J. Erickson began work on a new line, that of devising a 1000-line board without making a 1000-line switch. This they accomplished by a general plan very much like that of J. G. Smith, though the form of switch with which they had to deal was different. Fig. 48 shows the scheme of wiring, in which the switches shown at the left are the same style of connector as had been used at Michigan City, Ind., and elsewhere, with the plaster of paris bank. At the right, numbered 12, 13, 14 and 15, are groups of "selectors." These are special switches, with 10 vertical steps, but only one rotary. There is one for each subscriber and but one trunk from one group to any other one. Thus any subscriber's line will end at the central office in two places: first, in one of the selectors at the right, by means of which he can call any group and line in that group, and, second, in the bank of one of the connectors at the left, through which calls may come to him from other lines. The selector switches are grouped 10 in a group and 100 groups. The connectors are grouped in 10 groups of 100 switches each.

Fig. 49 shows the selector switch, front and side views. The bank, as shown, is made up of wires like the zither or piano wire-board, but it was drawn this way only for convenience. The plaster of paris bank was to be used. *B'* is the vertical magnet, *F'* the rotary magnet. *PM* is the private magnet. All three magnets are permanently connected to battery. 39*L'* and 35*L'* are the line wipers, while *L'* is the private wiper. The two line wipers are connected to the two springs 29 and 30 which form the side switch. Normally, the wipers are not connected to the lines.

Although Fig. 49 shows the general design of the selector, reference to the simplified diagram of Fig. 50 makes it easier to explain its working. There are also some mechanical movements which must be explained, not being clear in the Patent Office drawing, Fig. 49. The vertical magnet *B'* in addition to lifting the wiper shaft, operates a contact 100 which connects the rotary magnet to the frame. There is also a downwardly projecting hook on the lever which holds the detents away from the ratchet cylinders. The detents are released on the first upward motion of the magnet. The rotary magnet, besides rotating the shaft, operates a switch 101 which normally holds the private wiper *L'* on ground, but may switch it over to the private magnet *PM*.

The side-switch, 29 and 30, is under tension tending to close the contacts 31 and 32, which lead to the lines. The springs 29 and 30 are connected mechanically to the shaft and rotary magnet by means which can only be clearly represented by exaggerating the dimensions of some portions. 104 is an insulating number which connects to lever 105. The four levers 105, 106, 107 and 108 are here represented as in one piece, pivoted at the center. In reality a much simpler lever does the work. Acted on by the transmitted tension of the springs 29 and 30, 106 would move to the right but for the lug 109 on the shaft. When the rotary magnet pulls up, a finger *G'* holds 107 from moving and allowing 105 to close the side switch. If the

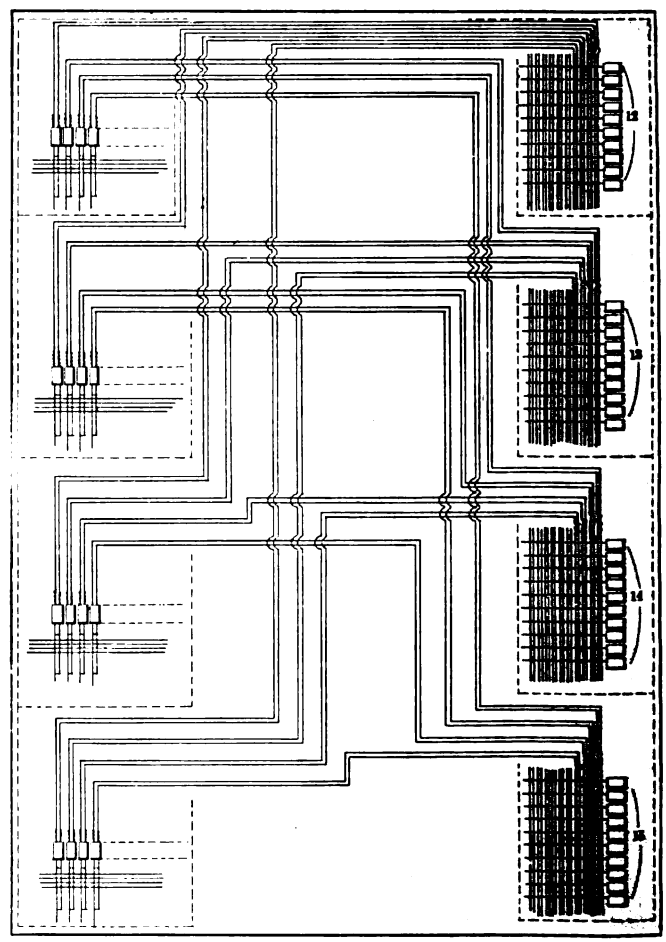

Fig. 48.—Scheme of Wiring Used for a 1000 Line Switchboard.

private magnet be pulled up, its lever 110 prevents 108 from moving and likewise keeps the side switch from operating.

The upper portion of the shaft is equipped with a bent wire 111 adapted to contact the spring 112 on the first upward motion and to break that contact with the first rotary motion. Its function is to connect the rotary magnet *F'* to the line at the proper time.

The operation was as follows: The hundreds digits come in

*Continued from issue of June 27, 1908.

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on the vertical line, operating the vertical magnet which steps the shaft up, releasing the detents on the first motion. The upward motion of the shaft brought the bent wire 111 into contact with the spring 112. The tens digits are next pulled, coming in over the rotary line and operating the rotary magnet. On the first impulse the rotary magnet pulls the shaft around one notch, moving lug 109 from lever 106. But the lever *G'*

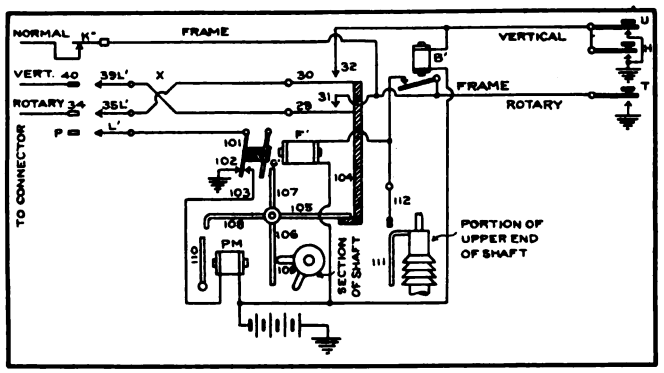

Fig. 50.—Simplified Diagram of Selector Switch.

of the rotary magnet prevents the side-switch from operating until the shaft has rotated far enough to break the contact 111-112. Then the rotary magnet falls back and allows the side-switch to connect the wipers to the lines. All this happens between impulses, so that only the first rotary impulse is lost, all the rest passing on to the vertical magnet of the connector, stepping it up. The units impulses come in over the vertical wire, but owing to the transposition of wires at *X* they arrive at the rotary magnet of the connector. It will be noted that the first tens digit is utilized in switching through the selector; that is, in rotating in the single step. Thus, one 10 would be lost in every hundred, and if a subscriber called 354, he would really move the wipers of the connector in the third hundred up and around to 44.

The private contacts in the bank *P* are multipled through the particular group of selectors to which a trunk is also multipled. When a trunk is occupied, the private contact corresponding to it is grounded by the private wiper of the switch which is using the trunk. If another selector tries to get in on the same trunk, the following will happen: When the rotary impulse comes in over the line, it pulls up the rotary magnet and rotates the wipers into contact with the bank. But the instant the private wiper *L'* strikes the grounded contact, 101-103 being closed, the private magnet *PM* pulls up, catching its hook under the end of lever 108. When the rotary magnet releases, 105 can move back a little, but not enough to operate the side-switch, leaving the trunk undisturbed. The rest of the impulses would do no harm.

To release from this condition the subscriber simply hung up as usual. This grounded the vertical, then the rotary, then cleared the vertical, followed by the rotary. When the vertical was grounded it closed the contact 100 connecting the rotary magnet to the line. Grounding the rotary pulled up the rotary magnet, which released the detents, pressing a lever from them under a hook on the lever of the vertical. When the vertical relay was released this hook passed down over the lever from the detents, locking them away from the ratchet teeth. The release of the rotary let the shaft rotate and drop back to normal.

The normal line over which incoming calls to any subscriber are received goes through the off normal switch *K"* on the top of the shaft. If the called line is busy by having made a call, this switch will be open and the calling subscriber will notice that his bell rings open, as calling was done by series magneto bells and hand generators.

In the fall of 1896 Almon B. Strowger, the originator of the system, left the employ of the Strowger Automatic Telephone Exchange and went to Florida to recover his health, which had been failing for some time.

On Jan. 28, 1897, the Automatic Telephone Exchange Company, Ltd., of Washington, D. C., was formed for the purpose of carrying on the automatic telephone business. Previous to this incorporation it had gone by the name of "Drawbaugh Telephone & Electric Appliance Company, Ltd., of Baltimore, Md., and London, England." Col. T. W. Tyrer, of Washington, D. C., was the general superintendent and leading spirit, and had associated with him John Bauernschmidt as vice-president, and Joshua Horner, both of Baltimore. It was the purpose of this company to sell the apparatus manufactured by the Strowger company, and with this end in view it entered into agreements with the latter on the date above mentioned. The Automatic Telephone Exchange Company was to act as United States agent for the Strowger Automatic Telephone Exchange. It was to pay a royalty of $3 per year "for each switch and outfit so long as such switch and auxiliary device may be in use," and was to install 3000 switches the first year and 2000 additional each year for 10 years. Deferred royalties were to draw 6 per cent.

In February, 1897, the Strowger company commenced installing the last described switchboard at Augusta, Ga. As far as known, this was the first trunking board to be put into actual public use, although it did not possess the feature of automatic trunk selection since there was only one trunk to any group.

The idea of using primary and secondary switches needs to be carefully separated from that of automatically selecting a non-busy trunk. The two are not necessarily the same, though wherever automatic trunk selection is used there must be two

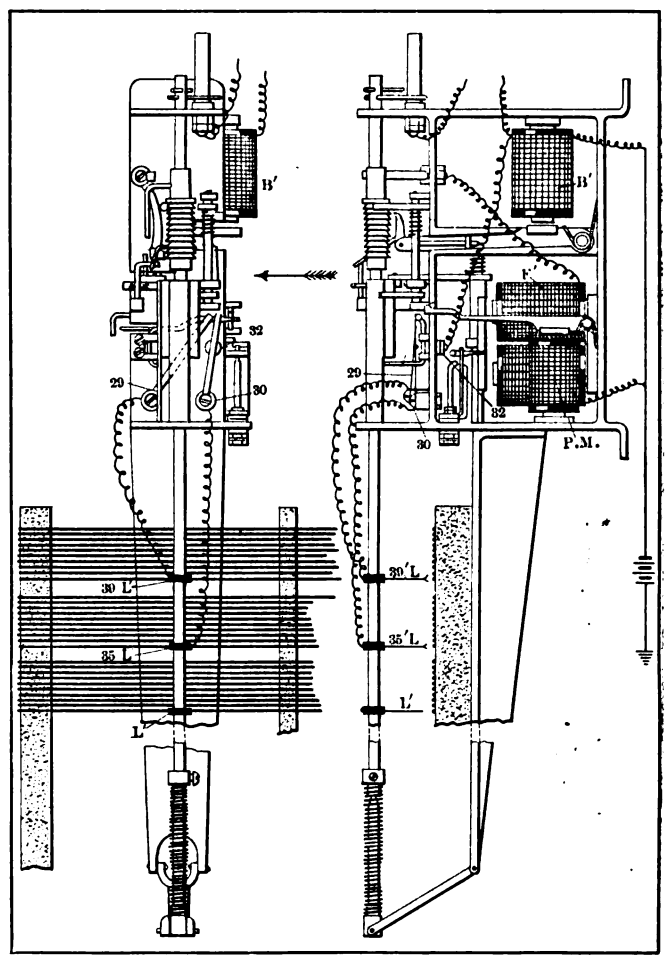

Fig. 49.—General Design of Selector Switch, Front and Side Views.

or more sets of switches. But, as will very readily be seen, the primary and secondary switch idea is of little practical use if we are restricted to but one trunk to each group.

The Augusta plant was completed in March, 1897, and possessed numerous points of interest in addition to the arrangement of switches. There were no wiper cords on the selectors or primary switches. The rotation of wipers to bank is shown

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by Fig. 51. The bank contacts were arranged in three groups, each group consisting of two vertical rows of 10 contacts each. All the contacts in the left-hand row, L_1, were tied together and connected to the vertical wire of the switch to which the bank belongs. The right-hand contact, T_1, of each pair was attached to the vertical line leading to a connector in a certain group of switches. The middle vertical rows, L_2 and T_2, were similarly devoted to the rotary line and trunks, and the

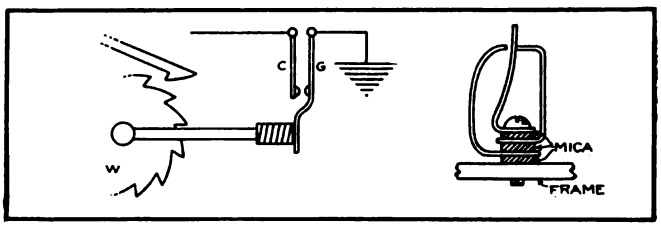

Fig. 52.—Arrangement to Separate Accidental Grounds on Line from Grounds Occuring in the Sender.

right-hand rows, L_3 and T_3, to the private. The wipers were U-shaped and when normal, rested where shown in the front view. If the shaft were lifted one notch and rotated one notch all the wipers would occupy the lowest row of contacts. In this position the vertical wiper V would connect together the two bottom contacts in rows, L_1 and T_1, thereby projecting the vertical line of the subscriber into connection with the vertical trunk to the first group of switches. The rotary wiper, R, also connects the rotary line to the rotary trunk by connecting the two bottom contacts in the L_2 and T_2 rows, while the private wiper, P, does the same for the private line. The wipers were made of two springs, as shown in the detail portion of Fig. 51, which shows end and side views with the wiper off and on contact. While moving vertically to reach the desired level the ends of the wipers were between the vertical rows, but not touching them, as seen in the plan.

The dial which was used was very much like that which had been invented and developed during the spring and summer of 1896, covered by patent No. 597,062. However, there was no indicator to show the order of the digit pulled, as it was considered a needless complication. The speed governor was a centrifugal affair instead of the weighted pallet escapement which was described. It worked more quietly and gave better regulation.

The dial proper carrying the finger holds was attached to its shaft by a cone fit, being held on by a machine screw in the center of the end of the shaft. The dial was insulated from the shaft by a layer of fiber to remove any possibility of subscribers getting shocks. The friction of this cone was not sufficient to prevent the dial from slipping, resulting in the user getting wrong numbers. To remedy this defect the cone end of the shaft was covered with shellac and paper and the dial forced on again over it. This stopped the slipping, though it made the removal of dials more difficult.

The ground connection was not wired permanently to the mechanism of the sender, but was carried to an insulated spring, as shown in Fig. 52. W is the star wheel, which carries a lever with insulation on the end. When the sending device is in its normal position, the receiver being on the hook, this insulated end bears against the ground spring and keeps it clear of the circuits. But the first motion of the dial pulls the star wheel to the left and allows the ground spring, A, to touch the spring, C. This arrangement was made to enable the separation of accidental grounds on lines from grounds occurring in the sender. If a line acted as if grounded, but only while calling, it was almost sure to be in the subscriber's instrument. For ground this system did not depend on the earth, but used a common return.

Since the magnets, each of 16 ohms resistance, were directly in the line, the line current had to be relatively heavy. In the case of the longer lines it took as high as 96 volts to force the required current (1 amp) through the resistance. As this was too high a voltage for the shorter lines, taps were taken from the battery at various points, giving three voltages beside the maximum. Even this was not close enough regulation and resort was had to the insertion of additional resistance in each of the shorter lines to even them up with the longest lines in their particular voltage group.

In Fig. 53 are shown the conditions which existed for one connection through the board. Each subscriber's line appeared to be metallic, and such they were from the substation to the office. But, in the switchboard, one side of each line was tied through a magnet to negative battery. The other side was carried to the wiper with no attached connections, and given a clear connection through to the called line. This arrangement produced cross-talk, but as the telephone-using public had not been educated by the quietness of a clear metallic circuit, there was no noticeable dissatisfaction. The arrangement of common return wires is also indicated by broken lines. It occasionally happened that two of these common return voltage feeders got crossed, which resulted in running down that portion of the battery which was between them. "American" storage battery was used, this being, as far as is known, the first public automatic exchange using secondary battery.

As might be expected, the heavy current used to operate the switches gave trouble by arcing at the make-and-break point in the substation sender. Occasionally the heat was great enough to take the temper out of a spring. There were no platinum contacts in the telephones, but the switches were equipped with them. For this reason there occurred dirty contact troubles in the talking and ringing circuits which could not be charged to the automatic system. Where platinum was used in the switches it was soldered on—not riveted as is the present practice.

Some of the lines running to Summerville were 3½ or 4 miles long, and on these special magnets of 70 to 80 ohms resistance were used. These more sensitive magnets had to be used, for it was not thought advisable to run the voltage any higher than the 96 volts. In November, 1897, a line was run to the canal locks, 7½ miles out. For this a ground return was used. As it was impossible to make the magnets work over this line, relays were installed to operate the magnets on a local circuit. This is one of the first, if not the first, case of using line relays on an automatic board in practical public use.

The mechanical construction of the switches was somewhat crude. Soldered joints were used to connect certain parts where a solid piece should have been made.

The rudimentary side switch, which controlled the private wiper, was simply a combination of one movable vertical spring between two fixed springs, all held by one screw and insulated from one another by bushings and mica plates. (See

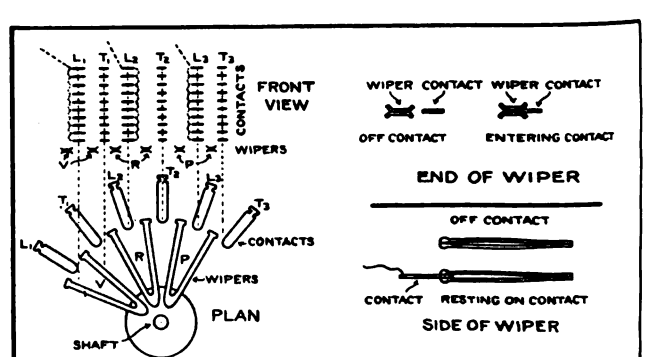

Fig. 51.—Details of Wipers, Showing Method of Rotation to Bank.

right-hand diagram, Fig. 52.) The mica insulation used to separate the springs often broke down. This was probably due to the use of acid in soldering connections to the springs. In other parts untreated fiber was used, which gave trouble by absorbing moisture. This is now avoided by boiling out in paraffine and beeswax and not using fiber for any large parts.

As the frames of the switches formed one side of the cir

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cuit they were all insulated from one another and from the supporting frame.

It was asserted by some who worked on the board that in certain cases magnet coils became defective through electrolysis, since the wires showed a corroded appearance. But this doubtless should be charged to the use of acid in soldering, for it is well known that such results are very likely to follow its use. Some trouble was caused by the friction of the shafts,

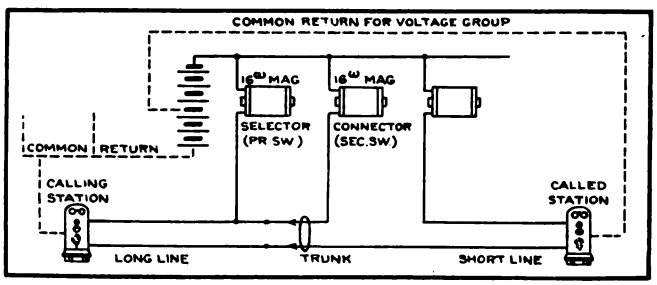

Fig. 53.—Diagram Showing Conditions Existing for One Connection Through the Switchboard.

which was sometimes so great as to prevent them from dropping clear down on the release.

The total capacity of this board was 900 lines, but only 400 were installed. The equipment was later increased to 600.

This exchange is most noteworthy in that it was the first public installation of the first successful attempt made by the Strowger engineers to get away from the single switch idea. Manual switchboards had been developed on the idea of the multiple, which makes it possible for the operator who answers a call to reach over the terminals of the entire exchange and select the called line. If we substitute for the human operator a switch with the proper number of wipers and for the section of multiple jacks place the bank of contacts, we shall have the type of automatic switch which had been used up to that time.

The forerunner of the manual multiple switchboard was the transfer board, in which the operator who answered a call trunked it to the position on the switchboard in which the called line appeared. It was relatively cheap in first cost, but slow in operation, since the concerted action of two operators was necessary to complete the circuit. If we substitute for the answering operator a selector switch, which can select the desired group, and for the second operator place the connector switch, which can select the line in that group, we shall have the idea underlying the Augusta board. Like the transfer board, it is cheaper in first cost. Unlike the transfer board, it is just as rapid as the older single-switch systems. The reason lies in the uniform rapidity of the mechanical and electrical actions, which are not subject to the varying delays which beset human beings. The automatic selector will get a trunk in a certain period or it will not get it at all. There is no guessing about it after a reasonable time has elapsed.

In March, 1897, Mr. B. G. Dunham began his work for the automatic people at Augusta, Ga. Mr. Dunham was an Iowa man, and had graduated from the Iowa State College at Ames, having taken the electrical engineering course.

The Augusta board showed that the principle of trunking is the correct one for automatics. The next problem attacked was how to get more than one trunk to each hundred. Evidently it would be easy to provide the selector switch with several contacts in each row, each contact representing a trunk line, all lines of a given level running to the same hundred. There each would terminate in a connector switch. If, on stepping a selector switch up to the level of the desired hundred and rotating it one notch, the first trunk proved to be busy, the switch wipers could be rotated another notch, or another, and so on until a non-busy trunk was secured. Although this sounds easy, it proved to be a difficult problem. One of the principles of automatic design which had by this time become clearly established is that the subscriber must not be expected to do things which will call for any degree of knowledge of the system. The system must be so arranged that any person of sound mind can operate it correctly on the first trial after reading simple directions. This principle restricted the selection of a non-busy trunk to such means as could be had from the regular operation of the dial and, of course, it was seen that the subscriber could not be called upon to assist consciously in operating that.

In June, 1897, the engineers of the Strowger company made their first experiments with a means for non-busy trunk selection. They proposed to insert in every number a "0" just after the hundreds digit. Thus, the number 248 would appear in the directory as "2048." The hundreds digit was to lift the wipers of the selector to the proper level corresponding to the proper hundred. The "0" digit was to give 10 rotary impulses to the selector shaft. On reaching the first non-busy trunk the current was cut off, so that the remaining impulses did no harm. The last two digits were to operate the connector the same as in the Augusta board.

(To be continued.)

The Right Attitude of a City Company Toward a Rural Company*

By Olin Jones.

A local company must not make the mistake of assuming that the farmer has no place in the telephone business, for in most cases it was through the failure of a local company to build the field and take care of the business that the farmer was forced into building his own lines. A local company should feel that the farmer has the same right to a telephone as any one else, for the telephone to the farmer is almost an indespensable necessity. In case of sickness, fire or any other emergency, he can summon help or transact business with a minimum delay. To the farmer the telephone is not only a business convenience, but it is a means of social intercourse as well. The telephone has modified the conditions under which the farmer works, and has made the country a safer, more pleasant place to live in, placing it on the level with the city in these respects.

The primary reason for the existence of the rural companies is that there was, and is to-day, a great unfilled demand for rural telephone service which we are unable to take care of. Some of us perhaps could not see the development of the rural business, and did not see that we could handle it at a profit, or more likely we could not finance our companies fast enough to take care of the business, and in that way compelled the organization of rural companies. I believe that inside of five years the local companies can own nearly every country line if they so desire, and operate it at a profit. The time was when, in town and country alike, we built inferior grounded lines, but these are giving way to better construction, and metallic lines, with a view to better service.

As the farmer realizes the value of the telephone more, and is educated to good service, he wants as good as can be given, and we have no subscribers who appreciate good service more. The owners of farmers' lines are beginning to see, since their lines have begun to need rebuilding, that their service has cost them more than they formerly thought it would. They are coming to realize that a well regulated company can look after their lines and give better service than is possible where no particular party takes care of them now, with the improvements in party line equipment which make party line service valuable. I believe that the farmer is usually willing to pay a reasonable price for the service. It must be remembered that farmers cannot be driven, and we should not wish to do this. They are suspicious of propositions with which they are not familiar, but when convinced that they will get a just and fair deal they are the best friends we have.

The attitude of a city company toward rural companies should be that of any other business concern to its associates. That is, we should show them the same courtesies as a mer-

*Abstract of a paper presented at the convention of the Missouri Independent Telephone Association.

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chant does his customers, and give them as good service as can be given with the equipment we have to do with.

Our attitude toward the rural companies should be one of friendliness, showing them that we appreciate their business. Let them feel that we are as anxious to give good service as they are to get it. We must not treat them as if we felt we are giving them more than we are getting pay for, since in many cases where we are doing that it is because we have not met them with facts and arguments to show them that we cannot do it and live. If we are doing that, let us give them as good service as we can, and start our educational bureau to work.

It is right for the city company to show the patrons of the rural company with plain, simple, honest arguments that they cannot get something for nothing, but that if they pay our rate we will endeavor to give them value received.

Progress in Chestnut Pole Preservation

By Howard F. Weiss,

Chief, Section of Research, U. S. Forest Service.

This article includes only points not developed in the former publications of the Forest Service on similar subjects, and is based largely upon the results of a series of experiments conducted at Parkton, Md., from August, 1905, to June, 1907, in co-operation with the American Telephone & Telegraph Company.

In former experiments it was found that poles to all appearances alike showed wide divergence in their behavior during seasoning and preservative treatment. The differences were supposed to be due to the conditions of growth, but those conditions had not been exhaustively studied; hence, in the later experiments studies were made of the trees from which the poles were cut. A complete history of each pole—its life, seasoning and treatment—was thus obtained.

The general plan of seasoning and treating was the same as that practiced in former experiments. The same apparatus was used, but the method of application was modified somewhat to obtain more specific information.

Statistics compiled by the Forest Service show that 3,574,666 poles were purchased in 1906 in the United States for telegraph, telephone, electric light and street railway uses. Cedar combines more desirable qualities for poles than any other wood, and 61 per cent of the poles used were cedar. Chestnut ranks next and supplied 28 per cent. The average age of a 30-ft. cedar pole is about 190 years and its length of life about 15 years. We, therefore, consume such a pole over 12½ times as fast as we can grow it. Cedar does not sprout from the stump, and its reproduction is a difficult problem. A chestnut pole of the same size can be grown under favorable conditions in about 42 years, and will last, on an average, 12 years. We consume such poles, then, only about three and one-half times as fast as we can grow them. Moreover, reproduction of chestnut is an easy problem, for it sprouts vigorously and prolifically from the stump. From four to five crops of chestnut poles can be grown to one of cedar. It seems, then, that for our future supply of poles chestnut will ultimately replace cedar, because of its ease of culture, its rapid growth and its adaptability to use.

GROWTH AND CUTTING OF POLES.

Seed-grown chestnut trees are of slower growth than sprouts, and much fewer poles are cut from them. Of the 550 poles cut at Parkton, more than 60 per cent came from sprout trees. The average age of the sprouts was 47 years, while that of the seed trees was 57. All these sprouts came from stumps that were poorly cut and had been given no protection whatever. Had the stumps been cut with a slant and the sprouts been given a proper amount of light, it is probable that few of them would have been over 42 years of age. Some poles which met the standard requirement of 36 in. basal circumference, were only 32 years old. No trees should be cut in summer or early autumn, for the stumps will not sprout, or, at best, will send forth only weak shoots. The greatest number of vigorous sprouts come from winter cuttings.

There is practically no difference in the taper between poles from sprouts and those from seed-grown trees. This is shown in Table 1. No difference in specifications, therefore, need be made between the two classes.

Careless cutting frequently causes decay in the stump. This decay enters the young sprouts and forms a hollow heart. Fifteen per cent of the poles cut at Parkton were decayed at the base, and 71 per cent of these were from sprout trees. The diameters of the holes varied from ½ in. to 5 in., and the decay extended up the pole from 1 ft. to 4 ft. Had the stumps been cut low, with a decided pitch to their surface, there would have been fewer decayed trees.

Chestnut belongs to a group of woods having a "ring porous" structure; that is, the concentric rings of large tubes which conduct water and are formed in the spring are plainly visible. The faster the growth of the tree, the greater is the amount

	Tree.			Pole.			
Class.	Age.	Height.	Circumference outside bark (4 ft. 6 ins. from the ground).	Circumference inside bark. At 6 feet.	Circumference inside bark. At 30 feet.	Circumference taper between 6-ft. and 30-ft. points.	Basis poles.
	Years.	Feet.	Inches.	Inches.	Inches.	Inches.	No.
Seed	56	72	43.77	37.28	27.82	9.46	146
Sprout	51	77	45.57	37.64	28.42	9.22	118

Since specifications for poles are given in circumferences and not in diameters, the former are used exclusively, in this article.

Table 1.—Comparison of Poles Cut from Sprout and Seed Trees.

of the denser summer wood which forms later in the year. This is the part which gives strength to the pole. A sprout-grown pole, therefore, possesses greater strength than one grown from seed. In brief, the best chestnut poles come from trees grown under a coppice management, because (1) a shorter rotation is necessary to grow them; (2) they give to the grower quicker and larger returns on the investment; and (3) they are stronger and hence safer under strain.

The height at which a pole is cut materially affects its taper. Other things being equal, a "rigid" pole—that is, one with a decided taper—is better than a "top-heavy" pole, or one with little or no taper. If cut low, the basal swelling of the tree will be included in the pole; if cut high, it will be excluded. It is best for silvical and commercial reasons to cut trees low.

It is well known that trees grown upon high elevations have a greater taper in the trunk than those grown lower down, because the soil is both shallower and drier. Poles cut from such trees, therefore, have the most taper. In the region where this study was made, the differences in elevation amounted to only 150 ft., but even this caused a marked variation. This is shown in Table 2, which is based upon 82 poles cut at exactly the same height above the ground.

Class.	Tree height.	Circumference inside bark. At 6 ft.	Circumference inside bark. At 30 ft.	Pole taper, circumference.
	Feet.	Inches.	Inches.	Inches.
Valley	74	37.93	28.02	9.91
Hill	66	38.07	27.23	10.84

Table 2.—Taper in Valley and Hill-Grown Poles.

As a result, the center of gravity in hill-grown poles is nearer the butt. For every inch increase in taper the center of gravity is about 0.15 ft. lower down. In a normal pole, when the taper is about 10 in., the center of gravity is 13.2 ft. from large end.

Specifications of the American Telephone & Telegraph Company require that a standard 30-ft. chestnut pole shall be not less than 36 in. in circumference, 6 ft. from the butt nor less than 22 in. in circumference at the top. A sound pole 28

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in. in basal circumference is strong enough to stand the strains of a standard 30-ft. pole, but as a precaution, and on account of decay, 36 in. is specified. If decay can be arrested through preservative treatment, this 8-in. allowance can be safely reduced. The top circumference would, of course, be correspondingly decreased. To find what form of pole would result from using a minimum 20-in. top circumference, as is now done in the smaller classes of poles, the tops of 350 trees, from which 30-ft. poles were cut, were measured. It was found that such poles would vary in length from 30 ft. to 55 ft. The average

Season.	Poles. weighed. Number.	Green weight per cu.ft. Pounds.
Spring	150	55.6
Summer	100	56.1
Autumn	150	56.4
Winter	150	56.4

Table 3.—Seasonal Variation in Weight per Cu. Ft.

increased length for those grown on hilltops was 10 ft., and for those grown on slopes and in valleys 15 ft. When the tops of trees left after the poles had been cut, were utilized for cordwood, 9 to 13 cords were obtained from 100 trees, which, valued at $3 per cord, increased the gross value of the trees from 13 to 20 per cent. Utilization of the tops, moreover, improves the condition of the forest.

SEASONING.

The absolute green weight of chestnut varies with the season, as is shown in Table 3.

This variation in density is due to the greater amount of water and food materials stored in the tree in winter. The oven-dry weight of chestnut, obtained by sawing disks from

Time seasoned. Days.	Fall cut. Moisture content. Per cent.	Fall cut. Weight per cu. ft. Lbs.	Winter cut. Moisture content. Per cent.	Winter cut. Weight per cu. ft. Lbs.	Spring cut. Moisture content. Per cent.	Spring cut. Weight per cu. ft. Lbs.	Summer cut. Moisture content. Per cent.	Summer cut. Weight per cu. ft. Lbs.
0.....	85.4	56.4	85.6	56.4	83.0	55.6	84.4	56.1
30.....	72.0	52.3	77.4	53.9	70.5	51.8	67.9	51.0
60.....	68.4	51.2	72.6	52.5	64.3	49.9	60.6	48.8
90.....	66.9	50.7	68.7	51.3	60.0	48.6	57.5	47.9
120.....	65.8	50.4	64.8	50.1	56.5	47.6	55.9	47.4
150.....	64.3	49.9	60.6	48.8	53.7	46.7	...	...
180.....	62.2	49.3	56.8	47.7	51.7	46.1	...	...
210.....	59.2	48.4	53.7	46.7	...	...	...	...
240.....	56.0	47.4	51.2	46.0	...	...	...	...
270.....	53.0	46.5	49.3	45.4	...	...	...	...
300.....	50.8	45.8	...	...	...	...	...	...
330.....	49.1	45.3	...	...	...	...	...	...
360.....	47.8	44.9	...	...	...	...	...	...

Table 4.—Rate of Seasoning of Chestnut Poles Cut at Different Times of the Year.

the poles and drying them at 100 deg. C. until they ceased to lose moisture, was 30.4 lb. per cubic foot. This weight is used as a basis throughout this article.

The rates at which chestnut poles, cut at different seasons, lost moisture are shown in Table 4 and Fig. 1.

Table 4 broadly substantiates the results of former experiments, which indicated that the most rapid drying occurs in summer-cut poles and the most uniform drying in those cut in winter.

The reduction in weight due to seasoning is of much practical importance in decreasing the cost of shipping. Fifty green

Cutting season.	Ship after—	Shipping weight per cu ft.	Moisture content compared with oven-dry weight.	Freight saved.
	Months.	Pounds.	Per cent.	Per cent.
Summer	2	48.8	60.6	13.0
Spring	3	48.6	60.0	12.6
Winter	5	48.8	60.6	13.5
Autumn	7	48.4	59.2	14.2

Table 5.—Shipping Table.

30-ft. poles loaded upon a car weigh about 56,100 lb. The freight rate for short hauls is about 15 cents per hundredweight. It costs, therefore, $84.15 to ship such a load. If the poles are seasoned for the periods given in Table 5, the cost of shipment will be reduced about 13 per cent, a net saving of approximately $11 per car. The periods given in this table minimize the insurance and storage charges, and secure the most favorable reduction in the cost of shipping.

Poles cut from trees grown in valleys lose about 6 per cent more moisture after six months' seasoning than those cut from trees grown on hilltops. Other things being equal, there is practically no difference between the rates of seasoning of sprout and of seed-grown poles.

Patches of bark which adhere to peeled poles decrease the rate of seasoning; they also resist the absorption of rainwater. The difference in weight at the end of one month's seasoning

Fig. 1.—Rates of Seasoning of Chestnut Poles Cut at Different Times of the Year.

between those with bark and those without was 20 lb. per pole, but at the end of one year's seasoning both contained the same percentage of moisture.

The top of a pole seasons faster at first than the butt—a condition ultimately reversed. These differences cause a small shifting in the position of the center of gravity, but in no case more than an inch.

Poles exposed to the sun and wind season faster than poles skidded in protected localities. At the end of 10 months' seasoning, poles skidded under the former conditions lost 26 lb. per pole more than those skidded in protected places. Skids should be built over ground which is as free of vegetation as possible. A skid built over bare ground lost, at the end of eight months' seasoning, 35 lbs. more per pole than one built over a rank growth of vegetation.

Poles absorb and lose rain-water very rapidly. Absolutely green poles absorbed ½ lb. per cubic foot in a rain storm of only 1.01 in., while thoroughly seasoned poles frequently absorbed more than twice that amount.

SHRINKAGE.

All of the poles were measured as in the previous experiments to ascertain the amount of shrinkage. The results obtained strengthen the former conclusions—that the shrinkage is so slight as to be almost negligible. In no case, even after 14 months' seasoning, was it more than 0.3 in. Hence the common impression that poles shrink ¾ in. in circumference is entirely erroneous.

The periphery of a pole is very susceptible to meteorological influences. A rain of only 0.6 in. annulled results of four months' shrinkage, but 48 hours after the rainfall the poles were again in normal condition.

Another misconception is that poles expand on freezing. Green poles measured before and after being frozen showed no change in the size of their periphery.

CHECKING.

Checks in a pole decrease its strength. In general, the greater their number and the larger their size, the weaker the pole. The characteristic checks in autumn-cut and winter-cut poles are numerous and small, seldom penetrating more than 1½ in. into the pole. Checks in spring-cut and summer-cut poles are few in number, but large and deep, sometimes 1¾ in. wide, 2½ in. deep, and 10 ft. long. Besides weakening the pole, these big checks serve as pockets for the retention of rainwater. As a result, winter-cut poles are superior in strength and durability to those cut in other seasons.

Defects such as cup shakes, frost cracks, or splits from careless cutting may seriously damage the pole, especially if it be cut in spring or summer. Such defects, which are incipient in green poles, sometimes expand until they form a split a foot

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or more wide at the end and over 9 ft. long. If such poles are treated immediately with S-irons, serious checking is prevented. Forty poles were treated in this experiment, and in none of them did the check expand more than ½ in. in width. The S-irons were made of iron ⅛ in. thick, 1 in. wide, and from 3 in. to 6 in. long, bent in the form of a letter S. They were driven into the ends of the pole over the check.

The practice of dragging poles for long distances over the ground should be vigorously discouraged, because thereby the outer layers of the wood are broken and sheared and the strength of the pole is materially lessened. Moreover, a pole in this condition is very susceptible to decay, because of the numerous crevices in which spores can lodge and in which rain-water can settle.

[Moisture loss in per cent of dry weight.]

Cutting season.	Days seasoning. 120. Soaked. Per cent.	120. Unsoaked. Per cent.	180. Soaked. Per cent.	180. Unsoaked. Per cent.	275. Soaked. Per cent.	275. Unsoaked. Per cent.	370. Soaked. Per cent.	370. Unsoaked. Per cent.
Spring	27.2	27.8	31.1	31.6	...	...	...	...
Summer	25.8	27.6	...	...	...	...	...	...
Autumn	20.1	20.5	23.7	23.7	33.1	32.7	39.6	37.9
Winter	21.5	21.7	29.5	29.1	34.5	34.1	...	...

Table 6.—Comparison of Seasoning in Soaked and Unsoaked Poles.

There was no apparent difference in the checking of soaked and unsoaked poles.

The size of checks varies with the atmospheric conditions, expanding and contracting with the changes in the moisture content of the air.

Poles cut in autumn and seasoned over winter recheck the following spring.

EFFECT OF SOAKING UPON SEASONING.

Fifteen poles of each month's cut were allowed to season one week and were then submerged in water for two weeks. It has been claimed that soaking dissolves out certain contents in the cells of the wood and causes it to dry more rapidly. The results in Table 6 show that this is true, but the difference in the rates of seasoning is so slight that it does not warrant the cost of the operation.

Preservative Treatments.

BRUSH TREATMENT.

In previous experiments with brush treatment the temperature and weight of the oil were taken before and after it was applied to each pole. This was too great a degree of refinement and entailed too much delay, considering the roughness of the work. In the later experiments the oil was heated in a large iron pot to about 220 deg. Fahr., poured into pails, and applied to the poles with brushes until it had fallen to a temperature of 200 deg. Fahr., when it was again reheated. Usually five poles could thus be treated at one time, which greatly facilitated and quickened the work. With this exception the operation followed the lines which had already been practised.

Absorption creosote per pole. First coat. Pounds.	Second coat. Pounds.	Total. Pounds.	Average temperature. °F.	Absorption carbolineum per pole. First coat. Pounds.	Second coat. Pounds.	Total. Pounds.	Average temperature. °F.
2.6	2.1	4.7	214	2.7	2.2	4.9	214

Table 7.—Absorption of Creosote and Carbolineum by the Brush Method.

Table 7 shows that carbolineum and creosote are absorbed in equal amounts; the first coat absorbed slightly more than the second. The depths of penetration with the two oils were also equal and averaged about ⅛ in. The table was compiled from results obtained by treating 92 poles with each material.

Best results are obtained by applying brush treatments to only thoroughly seasoned and dry poles. Oil applied to green poles will not penetrate, and the poles will check on drying. Many of the failures in brush treatment are due to this cause. Checks in seasoned poles are wholly or partly closed by rains, and if the poles are treated with oil while they are wet, the checks reopen when the poles dry and untreated surfaces will be exposed.

There was no difference in the way soaked and unsoaked poles took treatment.

A crew of three men can treat about 50 poles per hour with the brush, if two men paint and one man turns the poles on the skids.

OPEN-TANK TREATMENT.

The apparatus used in the open-tank treatments was the same as that used in former experiments. The method of treating, however, was modified to obtain more detailed information.

There were three main questions upon which data were desired:

(1) What effect has a long duration in hot oil upon the treatment?

(2) What effect has a rapid change from hot to cold oil upon the treatment?

(3) Do poles which have been soaked in water and then seasoned take better preservative treatment?

The treatments were therefore divided into three series. The results are given in Table 8.

Series 1 shows that there is no apparent advantage in leaving chestnut poles in hot oil longer than six hours. In those species which have a wide sapwood but the same thermal conductivity as chestnut, a longer duration in hot oil would, of course, result in a greater absorption and penetration. Because of its narrow sapwood, heating chestnut longer than six hours produces no better absorption; it volatilizes an unnecessary amount of oil, and increases the total cost of treatment.

Period immersion. Hot oil. Hours.	Cooling oil. Hours.	Cold oil. Hours.	Temperature of hot oil. °F.	Density of outer inch. Rings.	Penetration. Inches.	Average absorption of creosote. Pounds.	Basis poles. Number.
10	14	..	228	10	0.30	20.7	16
8	14	..	223	10	.29	21.3	8
6	14	..	225	8	.34	23.6	24
4	14	..	225	8	.33	20.9	24
SERIES 2.—EFFECT OF PLUNGING POLES INTO COLD OIL.							
6	..	2	229	9	0.34	21.3	24
4	..	2	231	7	.38	20.6	16
SERIES 3.—EFFECT OF SOAKING IN WATER.							
8	14	..	225	7	0.34	17.6	8
6	14	..	229	10	.31	19.6	16
4	14	..	227	7	.35	19.1	8
4	..	2	233	9	.35	24.4	16

SERIES 1.—EFFECT OF DURATION IN HOT OIL.

Table 8.—Results of Open-Tank Treatment.

It took about 21 hours to secure a penetration of 0.31 in. and an absorption of 22 lb., in the poles treated in series 1. In series 2, where the poles were heated in the hot-oil tank, and then immediately dropped into the tank filled with cold oil, practically the same results were accomplished in about one-third the time. This was due to the more rapid contraction of air in the heated wood, and a more complete utilization of the partial vacuum that had been formed. For a commercial treatment, variations of this method are recommended.

Series 3, with 48 poles as a basis, shows that soaking poles in water for two weeks resulted in no better absorption and penetration of the oil.

In general, the more rapid the rate of growth in chestnut, the wider the sapwood and the larger the amount of oil absorbed. The relation between the rate of growth and the absorption and penetration of the oil is shown by curves in Fig. 2, based on the analyses of 70 poles. Chestnut cut during the period of maximum rate of diameter growth is, therefore, in best condition, structurally, for treatment with creosote in the open tank, as it permits a greater absorption and deeper penetration by the oil—the two factors which, other things being equal, determine the effectiveness of treatment. The effect of rate of growth upon penetration and absorption of creosote is shown in Fig. 2.

Cutting season.	Absorption. Pounds.	Penetration. Inch.	Age last inch. Rings.	Moisture content. Per cent.
Winter	23.8	0.41	9	48.4
Spring	23.2	.36	9	48.9
Summer	22.8	.34	10	49.4

Table 9.—Effect of Season of Cutting upon Treatment.

Effectiveness of treatment is independent of the cutting sea-

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son. When differences in treatment occur, they are to be attributed more to differences in the moisture content of the poles than to differences in their physiological conditions. Thus, if chestnut poles cut at different seasons be dried to the same degree of moisture, the results of treatment will be the same. Table 9 shows the results obtained in this experiment.

When experiments are conducted in the open, rainstorms destroy the uniformity of results. Thus when poles were wet

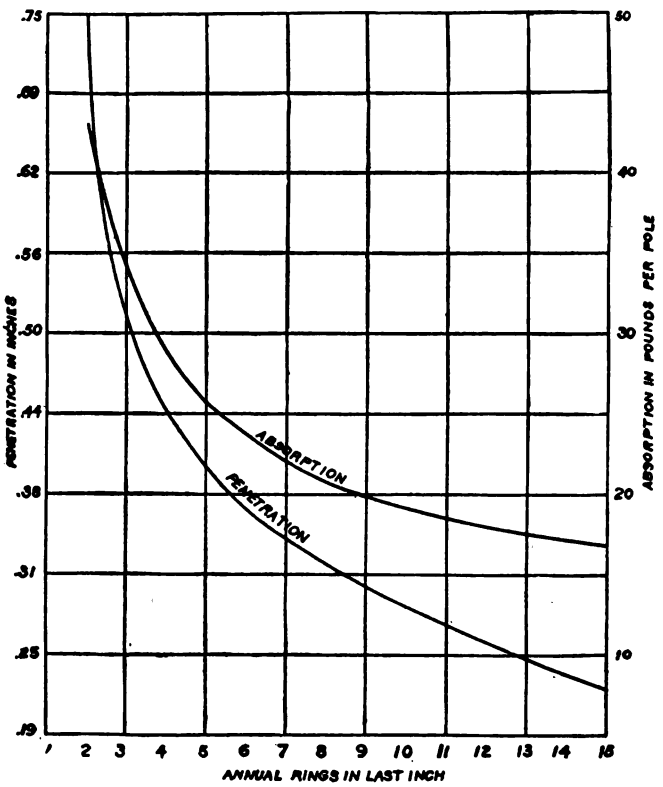

Fig. 2.—Relation of Rate of Growth With Penetration and Absorption of Creosote in Chestnut Poles.

they absorbed from 10 to 15 per cent less oil than when they were dry. This can be obviated somewhat by raising the temperature of the oil. Temperatures above 230 deg. Fahr., however, are not recommended, except as an emergency measure when the poles are wet, on account of the increased volatilization of the oil.

Poles that were damaged by dragging for long distances over the ground could not be given a satisfactory treatment. These poles frequently had portions of the sapwood entirely removed, and on such portions only a superficial penetration of the oil was obtained. Poles which had about one-fourth of their sapwood ground off absorbed 26 per cent less oil than those with entire sapwood. Uniformity of treatment gives best results; hence dragging should be vigorously discouraged.

Chestnut poles cut from intermediate or suppressed trees grown in valleys and in moist soil are not adapted to treatment in the open tank. A number of such poles were treated, and they absorbed only 13 lb. of oil per pole. Their penetration was only 0.19 in. Poles of this character can be distinguished from others, as their wood is exceedingly soft and their rate of growth is very slow.

It has been shown that chestnut poles absorbed about 4.8 lbs. of oil (either creosote or carbolineum) in two brush applications. If creosote costs 12 cents and carbolineum 80 cents per gallon, the total cost of treating a pole with creosote is about 12 cents and with carbolineum 50 cents, allowing 5 cents for labor for each.

CONCLUSIONS.

The results of the experiments at Parkton corroborate, on the whole, those obtained from former investigations.

The rapid growth of chestnut, coupled with its other intrinsic qualities, renders it one of the best kinds of wood for use as poles, and the demand for it will become of much greater importance in the future.

As the best poles come from sprout trees, care should be exercised in felling. It is sound policy for all pole users to encourage a careful system of cutting.

Soaking poles in water preparatory to preservative treatment is not recommended, as it results in no better absorption or penetration of the oil.

Incipient butt or top checks caused by careless cutting or natural defects should be treated with S-irons to prevent the poles from splitting. This applies especially to poles cut in spring and summer.

Chestnut poles seasoned for the periods given in Table 5 will be dry enough for preservative treatment.

The sapwood of chestnut, which is a thin layer, should be completely saturated with the preservative. This can be accomplished by heating the poles in oil for six hours and leaving them in the cooling oil overnight, or by heating them in hot oil for four hours and plunging them into cold oil for two hour.

Effectiveness of treatment is independent of the season of cutting, but depends directly upon the moisture content and the width of the sapwood. Chestnut poles cut during the period of maximum rate of diameter growth and thoroughly seasoned admit of best results in preservative treatment. Spring and summer cut poles reach such a condition more quickly than those cut in autumn and winter.

The Telephone Revolutionizing Farm Life

Full credit to the power of the telephone in revolutionizing farm life, along with other agencies that facilitate communication, is given by President Kenyon L. Butterfield, of the Massachusetts Agricultural College, in his recently published book, "Chapters in Rural Progress." President Butterfield shows that the problems of the city are those of congestion, while those of the country are the problems of isolation, and he emphasizes the great importance of the rural mail delivery, improved roads, the farm telephone and trolley lines in welding the farmers into a more compact society.

They are being nurtured into greater alertness of mind, greater keenness of observation, and the foundations are being enlarged for vastly broader social activities. "Telephones," says Professor Butterfield, "free mail delivery, electric car lines, operas, great libraries, cathedrals, all come to the city first, some of them solely to the city. The country cannot hope to be other than inherently conservative as regards such institutions. But may there not be found such adaptations of or substitutes for these institutions as shall not only preserve the rural community from decadence, but indeed, build it up into strength, beauty and purity? Comparative lack of identical resources need not mean poverty of attainment.

"The telephone is curing the evils of isolation, without in the slightest degree robbing the farm of its manifest advantages for family life. . . . The really great lessons that farmers are rapidly learning is to work together. . . . Rural telephone exchanges are a relatively new thing, but the near future will see the telephone a part of the ordinary furniture of the rural household, while electric car lines promise to be the final link in the chain of advantages that is rapidly transforming rural life, robbing it of its isolation, giving it balance and poise, softening its hard outlines, and in general achieving its thorough regeneration. This sketch is no fancy tale. The movement described is genuine and powerful.

"Anything that makes farm life more worth living, anything that banishes rural isolation, anything that dignifies the business of farming and makes it more prosperous, anything that broadens the farmer's horizon, anything that gives him a greater grasp of the rural movement, anything that makes him a better citizen, a better business man, or a better man, means the passing of the mossbank . . . with the advent of the telephone . . . we shall find farm life taking on a new dress, and perhaps farmers' wives may come to enjoy the envy of those women who are unfortunate enough not to have married farmers. . . . Isolation has been the bugbear of

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farm life. It must be overcome partly by physical means. There must be a closer touch between individuals of the class and between farmers and the dwellers in the town and city.

"Recent investigation in the states of Ohio, Michigan and Indiana showed that out of 200,000 subscribers [Mr. Butterfield's figures are much too low—EDS.] to the Independent telephone companies of those states about one-sixth were in farm homes. A few years ago hardly a telephone could be found in a farmer's family. This business is constantly increasing. The established telephone companies are pushing their work into the country districts, small local exchanges are being formed, and soon the farmers, in the North at least, will be almost as well served by the telephone as are the people of the smaller cities. . . . None of these agencies can be spared or ignored. The function of each must be understood and its importance recognized."

Discussion of American Telephone Service

In an interesting article in the London *Times*, Mr. Herbert Laws Webb, the well-known English expert and contributor to these pages, discusses telephone progress in America. Among other things he says: "The secret of the extensive use of the telephone in America is that telephony in that country is a highly specialized technical business, whereas in Europe it has been the sport of politics, and has generally been relegated to the position of a minor branch of the government department responsible for posts and telegraphs, a position in which enterprise, scientific organization and continuous study of the requirements of the public are not to be found.

"The essential features of American telephone practice, the factors which bring about such great results, are uniformity of equipment, both of exchanges and subscribers' stations, constant improvement in technical methods, and minute and unceasing study of the traffic, of the operating methods, and of the requirements of the system.

"The most interesting feature of American telephone administration, the one that is responsible for a city service of 30 seconds, a suburban service of very little more, and a long distance service of a few minutes, is the traffic department, which constantly watches the traffic, tests and measures the traffic, analyzes it, and studies it from every point of view.

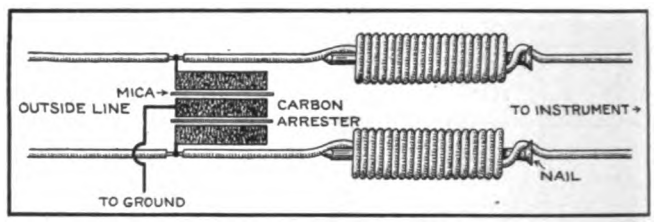
"To do all this work naturally demands a highly expert organization. The volume of telephonic traffic is prodigious, and the complexity of the system, with its hundreds of thousands of units gathered into one vast organism, is very great. To-day there are city telephone systems which handle well over a million calls daily—four times the number of telegrams which circulate daily in the entire United Kingdom. Every American telephone company has its traffic superintendent, who has entire charge of the operating department. His staff consists, roughly speaking, of two divisions—the operating force, which conducts the traffic, and the supervisory and engineering force, which tests and measures the traffic, compiles statistics, investigates methods of working, suggests improvements in methods or in apparatus, and states the requirements of the traffic department when new exchanges or extensions are contemplated.

"As to economy resulting from improved efficiency, reference may here be made to a new method of operating suburban calls which was being brought into use last month in New York. The suburban call in America is already amazingly quick. Tests in this connection made in New York last month showed that in no case, day, night, or Sunday, was the answer delayed longer than 90 seconds. To the reader this will seem incredible, but it is a fact. A similar test made the other evening, at the very slackest time of day, to a place less than 40 miles from London, took just half an hour, and the man at the other end had been trying for an even longer period to get through to London. But the new method of working suburban calls devised by the traffic department of the telephone company in New York results in making the suburban call within a few seconds as quick as a local call."

A New Idea on Telephone Protection

A well-known telephone engineer, in a letter dealing with the subject of protecting substations against lightning, writes as follows:

"In sections where a great deal of trouble is to be expected from lightning, experiments have come to my attention which seem to show the value of an idea which may interest some of your readers. The plan is simply to take a pair of ordinary 20- or 40-penny wire nails, and, after the ordinary carbon-block type of arrester is put up, to wind each of the wires leading



A Simple but Effective Lightning Arrester.

from the lightning arrester to the telephone around a nail. As many turns should be taken as will lie in a single layer along the whole length of the nail. The coil surrounding the nail presents an enormous impedence to the lightning discharge, and makes it invariably take a side path to ground offered by the gap between the carbons. People doing this will very rarely, if ever, have a telephone burn out."

LETTERS ON PRACTICAL SUBJECTS

Proper Division of Toll Receipts

In reply to your letter referring to query 1045 in your issue of August 1 and requesting our plan of settling interchange long distance messages the Telephone Traffic Association of Nebraska divides as follows: Each company receives 12½ per cent. commission on all business originated and 12½ per cent. commission on all business terminated. The remaining 75 per cent is pro rated among the companies in the ratio that their line is to the total distance that the message is carried. In applying this to the inquiry the division would be as follows: The message originating at *S* and terminating at the home office, say at the rate of $.30, would be pro rated thus: *S* would receive 12½ per cent commission ($.0375) and 6/48 of $.225 ($.0281), a total of $.0656. *W* would receive credit for its six miles of circuit, which would be 6/48 of $.225 ($.0281). The toll line or home office would receive 12½ per cent commission for terminating (.$0375) and as mileage 36/48 of $.225 ($.1688).

Collected for message		$0.30
Home office, mileage	$0.1688	
Home office, commission	0.0375	
W, mileage	0.0375	
S, mileage	0.0281	
S, commission	0.0375	
Total		$0.3000

This will apply to messages either sent from *S* to the home office or from the home office to *S*, and the same plan would apply to messages originating at *S* or points beyond and terminating at the home office or points beyond.

This plan has been used throughout the State of Nebraska for three years past and has been accepted by all our companies as a fair and equitable basis for settling long distance business passing over lines owned by several companies. The work of handling this interchange business is not attempted by any one company, but is reported to a clearing house which handles all of the interchange business.

R. E. MATTISON,
Secretary, Telephone Traffic Association.

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The Telephone in the Courts

CONDUCTED BY A. H. McMILLAN.

Incorporation and Interference

We are incorporated for $5,000 at $30 a share. We have taken all of these shares. Will we have to reincorporate or can we still go on just the same? What is the law here in Tennessee? What about different telephone companies' lines getting crossed up. We have two telephone companies to contend with. Their lines get down on our lines. They won't take their wires off our wires when we notify them. What can we do?

It will not be necessary to reincorporate. If you wish to sell more shares you may increase your capital stock. The method is provided for by the Tennessee laws, which should be consulted. If your competitors' lines come in contact with yours, you may either sue them for damages, or else get an injunction restraining further interference.

Injunction Litigation in Kentucky

Injunction litigation between the Kentucky & Indiana Telephone & Telegraph Company, on the one side, and the Rural Telephone Company and the Cumberland Telephone & Telegraph Company on the other side, is probably at an end, the motion before a judge of the court of appeals for dissolution of the Daviess circuit court's injunction in favor of the Kentucky & Indiana company having been determined in favor of the defendant Rural Home Telephone Company. This was the second suit filed by the Kentucky & Indiana company to prohibit the Rural Home company from severing the connection between its county exchanges and the Owensboro exchange of the former company. The first suit was filed on January 4, 1907, and an injunction was granted by Judge Birkhead compelling the Rural company to reconnect its exchanges with the Owensboro exchanges of the Kentucky & Indiana company and maintain an interchange of telephone service. This case was tried out and an appeal was taken by the Rural company from the judgment of Judge Birkhead, and this judgment was reversed on February 20, 1908.

Before the mandate of the court of appeals could become effective and the Rural company sever its connections with the Kentucky & Indiana company, the latter company brought a suit almost exactly like the first, except that it stated that the court of appeals had reversed the former judgment because the complainant had no franchise, and that since the former judgment, it had acquired a franchise to do business in Owensboro. Having obtained its franchise, it claimed that there was no obstacle in the way of granting the injunction compelling an interchange of service between it and the Rural company, as required by section 199 of the state constitution.

Company May Fix Its Own Field of Operations

In the suit of H. N. Thomas against the Farmers' Mutual Telephone Company, the Central District & Printing Telegraph Company and the McMurray Telephone Company, the court at Washington, Pa., decided that the plaintiff was not entitled to the relief prayed for and his bill was dismissed with costs. The plaintiff requested the Farmers' Mutual company to install a telephone in his residence and was informed that he was not near enough to the existing line of the defendants to enable them to conveniently render him such service and he would have to procure service elsewhere. The plaintiff on his own notion, cost and expense built a line from his residence to the Hogg farm, a distance of three miles, where a residence is in connection with the Farmers' Mutual company. He again requested the defendant to furnish telephone service, and the request was refused. Thomas then filed a bill for mandatory order upon the company to compel them to connect his residence. The court, after reviewing the facts in the case, holds that it cannot compel the companies by mandatory injunction to make connection with the plaintiff's branch line, that the company has the right to fix, determine and limit the field of operation in which it will engage in the business of serving the public and in so doing binds itself to supply service to every one who desires service only within these limits.

Notice of Defective Condition of Wires

A telephone company is entitled under the law to a reasonable time in which to make necessary repairs, after obtaining actual knowledge or constructive notice of the alleged defect, before responsibility for neglect to make proper repairs can attach to it. This was the holding of the Supreme Court of Indiana in a suit in which it was alleged that a wire suspended over a street was so placed that it sagged to about 8 ft. from the surface of the street and was not high enough to permit regular travel under it. It was also charged in the complaint that the wire had been in that condition for a "number of days or weeks" prior to the accident to the company's knowledge; that it was the company's duty under an ordinance of the town to maintain its wires, etc., so as not to interfere with public travel, and that plaintiff drove against and was caught by the wire. The ruling was made upon a demurrer to this complaint, the court holding that the complaint was insufficient to charge the company with the liability.

Cumberland Telephone & Telegraph Company vs. Pierson, 84 N. E., 1088.

No Fraud Found Against the Farmers' Telephone Company

At Everett, Wash., Judge Black has announced a decision for the defendants in the case of Charles A. Barron and others against the Farmers' Mutual Independent Telephone Company, wherein it was sought by Barron and his associates, former stockholders of the company, to set aside a transfer of the stock and property of the company on the ground of conspiracy and fraud.

The Skagit Farmers' Mutual Telephone Company, of which the plaintiffs were the promoters, owned valuable lines and franchises in Skagit and Snohomish counties. They found it necessary to raise a loan of $50,000, for which they pledged the stock and property of the company as security. The security was forfeited by failure to repay the loan.

The plaintiffs sued to recover, alleging conspiracy and fraud of the defendants, who caused the forfeiture, and praying for the right to redeem the property under the terms of the pledge, alleging the latter to be a mortgage, while the defendants asserted it to be a conditional sale.

Judge Black announced that he would find no fraud, and held the agreement by which the property was pledged to be a conditional sale, by which title had passed without an equity of redemption.

Mandamus Not the Remedy

At Milwaukee, Wis., Judge Ludwig has quashed the writ of mandamus requiring the Wisconsin Telephone company to install telephone service for K. Kieckhefer & Company. It was claimed in the petition seeking the writ of mandamus that the telephone company as a public service corporation had to give the service demanded. The attorneys for the telephone company argued that Kieckhefer & Company should have begun proceedings to enforce specific performance of the alleged contract instead of seeking relief by mandamus, and this contention was sustained by the court.

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Telephone Finances

Cuyahoga Company Shows Continued Gains

Following is the financial statement of the Cuyahoga Telephone Company for July, compared with July, 1907. The statement shows a continuance of the exceedingly satisfactory conditions which have for some time past been indicated by this company's statements. It shows an increase in gross income of $3,900 and a decrease in operating expenses of $4,670, an increase in net of $8,603. There is reserved for depreciation $4,959 for the month, as against $1,250 reserved last year. The net amount carried over to surplus is $14,363, as against $4,502 for last year, a gain of $9,861. This is the statement:

	July, 1908	July, 1907	Inc.
Gross earnings	$68,748.34	$64,814.84	$3,933.50
Total expenses	30,955.52	35,625.72	*4,670.20
Net earnings	$37,792.82	$29,189.12	$8,603.70
Interest on bonds	11,288.34	11,250.00	33.34
Surplus	$26,509.48	$17,939.12	$8,570.36
Deductions from surplus:			
Div. on pfd. stk	$7,186.75	$7,186.75	.....
Div. on com. stk	.....	5,000.00	*5,000.00
Res. for deprec	4,959.12	1,250.00	3,709.12
Total deductions	$12,145.87	$13,436.75	*$1,290.88
Net surplus	$14,363.61	$4,502.37	$9,861.24

*Decrease.

July Statement of Cumberland Telephone Company

The following is the statement showing results of operation of the Cumberland Telephone & Telegraph Company for July:

Earnings from exchange service	$350,945.44	
Earnings from toll service	128,235.05	
Miscellaneous revenue	20,913.62	
Total gross revenue		$500,094 11
EXPENSES: General (including taxes)	$56,970.83	
Operating	109,009.15	
Maintenance	118,815.92	
Instruments	21,280.53	
Miscellaneous (including interest)	14,743.38	
Total gross expense		320,819.81
Balance revenue		$179,274.30
Increase in gross revenue over corresponding month last year		25,242.69
Decrease in gross expense over corresponding month last year		21,722.81
Increase in net revenue over corresponding month last year		46,965.50
Per cent. of gross telephone expense to gross telephone revenue		63.29
Per cent. of net revenue to capital stock		10.93

These figures may be taken as an evidence of general stability and prosperity in the South, which has been getting good prices for all its products throughout a long period.

Practical Questions and Answers*

Feeding Battery Current to Small P. B. X. (1054)

I have a small P. B. X. run by storage battery which is lower in voltage than the main exchange battery. I want to adjust the resistance of some lines to the office so that I can float the P. B. X. battery on the main battery, so that while the P. B. X. is idle the smaller battery will be charging from the larger. But, when the load comes on the P. B. X., I want the two batteries to divide the load, I know what the current for the board is under ordinary conditions, also the voltage of both batteries. Can you give me a method for figuring out how much line resistance I must have?

Owing to varying nature of traffic on small boards it will be difficult to get a good, steady balance between the two sets of battery, and it may be necessary to allow the large battery to charge the small one more than half the time. That is, make it carry the load of the P. B. X. board under ordinary use. By means of a switch you can cut the feeder off when necessary to prevent too much overcharging. The following formula will give you the resistance of the line:

R = resistance, loop, of leads from large battery to small.
E_1 = voltage of main battery.
E_2 = voltage of P. B. X. battery.
I = current to P. B. X. board.
R_1 = internal resistance of main battery.
R_2 = internal resistance of P. B. X. battery.

$$R = \frac{2(E_1 - E_2)}{I} - R_1 + R_2$$

In most cases the internal resistance of the battery may be neglected, as it is so low in comparison with that of the wires as not to count. Thus, we would omit the last two terms of the formula.

Danger in Touching Insulated High Tension Lines (1055)

Is there any danger to a person if he should touch a wire carrying high voltage, provided both sides of the electric light line are perfectly insulated? I mean an ideal case, higher insulation that we can ever get in practice. When men get killed by high voltage, isn't it nearly always because the other side of the circuit from the one he touched had even a slight ground on it? I do not see how you can get a current unless there is a complete circuit for it. Please explain.

It is undoubtedly true that many cases of death are caused by the faulty insulation of one or both sides of power circuits carrying dangerous potentials. Small leaks are often sufficient to do the deadly work. In practice it is, of course, impossible to secure perfect insulation, as suggested, and this fact brings danger. But even if both sides of the circuit are perfectly insulated, it is possible to get a shock by merely standing on the ground and touching one wire. The reason for this lies in the capacity of each wire with regard to the earth. This capacity

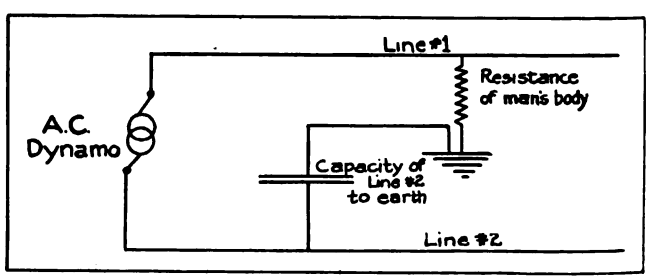

Fig. 1055.

acts like a condenser connected from the line to the ground. When a man standing on the ground touches one wire of such a circuit, current will flow from line No. 1, through the man's body to ground, up through the condenser to line No. 2 and so back to the dynamo. The condition is represented by Fig. 1055. We have then an alternating voltage applied to a resistance and a capacity in series. If we know the voltage and frequency of the dynamo, and length of line No. 2, its diameter and distance from the ground, and the resistance of the man's body, we can calculate the current which will flow through the latter. The capacity of the line to earth is given by

$$C = \frac{.0206}{\log_{10} \frac{4H}{d}}$$

in which H is the height of the wire above ground, d is the

*Replies to queries in this issue are furnished by Arthur Bessey Smith, Asst. Prof. of Telephone Engineering, Purdue University.

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diameter of the wire, both H and d being in the same units. The capacity C will be in microfarads per mile (5280 ft.), so that if C be multiplied by the length of line it will give the capacity desired.

Having the capacity of the wire, the current will be

$$I = \frac{E}{\sqrt{R^2 + \frac{l}{39.48 f^2 C^2}}}$$

in which E is the voltage of the dynamo, R the resistance of the body, f the frequency of the current, and C the capacity of the wire to ground for its entire length. The most uncertain factor is the resistance of the body, no two men having the same and the same man varying from time to time and according to the points where he makes contact. However, it is a safe proposition to keep hands off high-tension lines and not try any experiments. Taking the case of a No. 6 B. & S. copper line, 25 ft. from the ground, carrying 6000 volts at 60 cycles per second, we find that if the man has no resistance in his body, a line 34 miles long will have capacity enough to pass 0.200 amp. If his body has a resistance of 5000 ohms, which is common, it will cut the current down to .197 amp, which is not appreciable. The capacity reactance is so high that the actual resistance of the body does not have very much to do with the case. In figuring the length of the line, count only one wire, but include all branches attached to it, as they all add their capacities to that of the main wire.

Telephone News

Official Proceedings of the Michigan Independent Telephone Association

The official proceedings of the eleventh annual convention of the Michigan Independent Telephone Association, which was held at Detroit on March 24 and 25, have been published in book form. They run through 64 large pages, being very complete and containing so much information concerning the situation in Michigan that they will form a valuable addition to the telephone manager's library.

On a front page are portraits of the officers of the association and several members of the committees. The names and addresses of officers, committees and members of the association and the vice-presidents of the districts with the counties included are also given in the front pages.

A directory of the companies giving the officers, headquarters, number of exchanges, toll stations, and other information appears in the back.

New Telephone Ordinance for Oklahoma City

For some time past there has been considerable discussion in Oklahoma City, Okla., regarding the telephone situation. It appears that the Pioneer Telephone Company announced its intention to install slot machines on all telephones. The citizens vigorously opposed this action and investigated the franchise of the company. As a result the City Council has passed an ordinance to govern the conduct of the telephone business in the city. The franchise provides a fine of $100 and a jail sentence of not more than 30 days for a violation. Among its provisions are the following:

Slot machines are not to be installed unless a subscriber makes a request for them; telephones must be installed by a limited time after application is made, providing wires are within a certain distance of the place where the telephone is desired; there shall be no discrimination between patrons and all patrons and their customers shall have a free and unlimited use of the telephone; there shall be no raise in rate during the life of a written contract specifying that rate, even though a telephone company gains enough subscribers to justify an increase under its franchise rights.

The passage of the ordinance was secured only after a very bitter fight. It is not known what action will be taken by the Pioneer Telephone Company, but it is thought that they will carry the case to the courts.

Telephone Conduits Interfering with Sewer Construction

Considerable agitation has been caused by the attempt of the Empire Construction Company to cut the cables of the Chicago Telephone Company in Maywood, Ill. The construction company was given a contract by the village board to lay a sewer to connect with the sanitary district, and the conduits of the telephone company were the only public service properties overlooked in the ordinance prohibiting damage to service mains of any kind. The sewer is being dug at a lower level than that occupied by the telephone conduit, by a machine which could not be taken up without additional cost. Because of these conditions the construction company announced its intention of cutting the telephone cable in order to proceed with its work. It was feared that, if the construction company cut the cables, telephone service to all western points would be indefinitely interrupted. Much indignation was aroused among the citizens of Maywood, and in conjunction with the officials of the telephone company, they petitioned for police protection. An injunction was granted preventing the construction company from cutting the cables. It was feared that the construction company might take vigorous action to circumvent legal action, and to defeat any such movement, police were detailed to keep a close watch on the conduits.

In order to cross the conduit it will be necessary for the construction company to excavate by hand until the obstruction is passed.

New Independent Toll Lines in Kansas

An Independent toll system from Hutchinson to points in eastern Kansas and western Missouri is soon to be constructed. It will start at Hutchinson and extend from that city to Wichita, and from Wichita to Abilene and points in eastern Kansas. This line makes it possible to connect about 12,000 telephones around Wichita with about 75,000 telephones in eastern Kansas and Kansas City. The capital stock of the new company, which is to promote this enterprise, is said to be in the neighborhood of $50,000, and is controlled by the Kansas City Home Telephone Company, the Union Telephone & Telegraph Company, of Abilene, Kan.; the Wichita Independent Telephone Company and the B. & B. Telephone Company, of Hutchinson. The great expansion of the Independent service among the farming communities makes the trunk lines between the cities named, necessary for toll line service.

Recovering Telephone Retained by Subscribers

A replevin suit of the Ozark Bell Telephone Company against J. R. Brake at Springfield, Mo., illustrates how much of a company's trouble is caused by wrong impressions on the part of subscribers. The suit was brought by the company to get possession of one of their telephones which was installed in Brake's home. When one of the company's collectors went to him, he complained of poor service, and refused to pay for a quarter's worth of calls he claimed never to have received. Then, when an employee went to take out the instrument, he refused to allow it to be done, so the company had him served with a writ of replevin. The trial, in which Brake acted as his own attorney, made clear that he thought a bell rang in the central office whenever he took down the receiver of his telephone in his home. "Now, isn't it true," asked Brake, address-

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ing R. G. Porter, manager for the company and a witness, "that every time I take down my receiver a bell rings in the central office to inform the girl that I am on at the other end?"

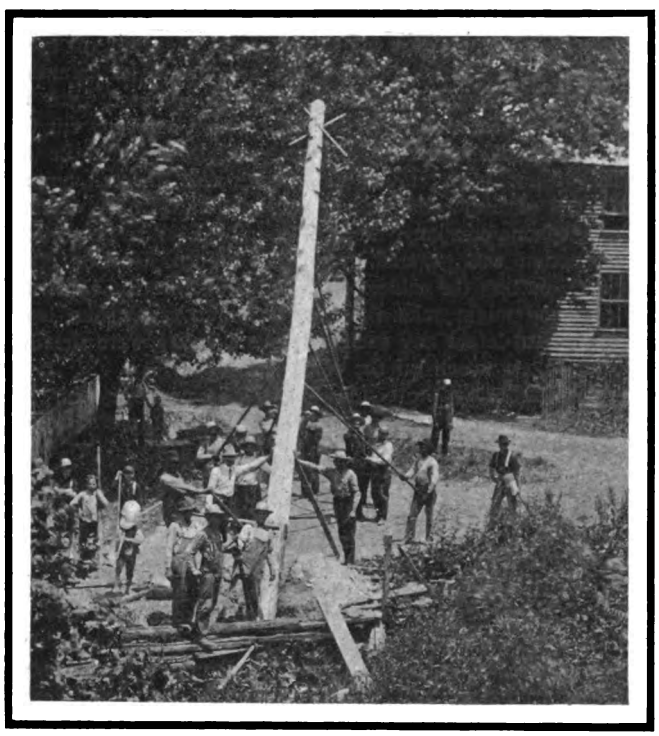
"We have 3,500 telephones, and on an average 300 calls every two seconds," said Mr. Porter. "Do you think a girl could distinguish a ring from your telephone from three hundred others ringing at the same time?"

As a result of Brake's refusal to pay 25 cents, the suit cost him $10.45, the jury bringing in a verdict in favor of the telephone company.

New Exchange at Mt. Morris, Pa.

The Mount Morris Telephone Exchange Company, the Independent company of Mount Morris, Pa., is rebuilding its system in that place. New 35-ft. and 40-ft. poles have been set throughout the town, and a new lead cable put up.

The plans and specifications were made by H. K. Sarver, general manager of the Greene County Telephone & Telegraph



Raising a 40-Ft. Terminal Pole in Mt. Morris, Pa.

Company, of Waynesburg, Pa. A new switchboard of the latest design, of 300-line capacity, with two operators' positions, has been installed.

All telephones will be put on copper metallic circuits, and many new telephones will be put in as soon as the service is cut over. This company has long distance metallic lines to Waynesburg, Point Marion, Carmichaels, Morgantown and Blacksville.

J. A. Harney Resigns Position as Assistant Secretary of International Association

At a meeting of the executive committee of the International Independent Telephone Association, held in Niagara Falls, August 15, the resignation of Mr. John A. Harney as assistant secretary was accepted, and a formal vote taken, expressing the appreciation of the committee for the active and loyal efforts exerted by Mr. Harney in advancing the interests of the association and its members.

He became identified with the Association's work in February, 1905, during Mr. J. B. Hoge's administration as president. The following June he was elected assistant secretary, which position he has continuously held up to the present time. His relations with the Association date from the consolidation of the National and Interstate associations into the present organization, during the greater portion of which period he was the active official thereof.

Mr. Harney resigns for the purpose of becoming associated with the new magazine, *Popular Electricity,* just starting in Chicago, and will be the circulation and office manager of that publication.

His many friends, which include his former associates, all wish Mr. Harney great success in his new undertaking.

Correction of Statement on Validity of Stock Issues

A correspondent familiar with the situation writes as follows: "Referring to the article on page 183 of the issue of the JOURNAL for Aug. 22, in regard to the New York & Eastern decision affecting the validity of stock issues, I desire to call your attention to the article generally, and one misprint in particular. The case was decided in New Jersey and not in New York, where there is not a Court of Chancery. The decision is not one of a court of last resort. It was handed down in November, 1907, and early in March, 1908, upon a motion to reargue the matter, the same court stood by its decision of last November, and the matter comes up in the court of last resort this fall. This matter is to be argued this fall, and when the decision is handed down, we will know what the New Jersey law upon this subject is, at least up to date."

Picnic of Telephone Employees' Aid Society

The second annual picnic of the Independent Telephone Employees' Aid Society of United States Telephone and the Cuyahoga Telephone Companies was held at Luna Park, Aug. 15, 1908. The program included the following sports: Baseball, races of various kinds, tug of war, potato race, bean race. shoe-lacing race, hand-line throwing, hammer throwing and pole climbing.

The general committee in charge of the picnic was: F. R. Lockwood, chairman; C. H. Fisher, George Getzien, H. O. Leinard, Rich. Ross, Miss Hays, Miss Groves and Q. E. Elwell. The officers of the society are: President, Q. E. Elwell; vice-president, P. C. Davis; treasurer, R. M. Ross; secretary, Charles H. Fisher; trustees, Q. E. Elwell, George Getzien, G. R. Kirtland, J. C. Boush and Amelia Groves.

Courts to Determine the Validity of Franchise

The Metropolitan Home Telephone Company, of Boston, has decided to ask the courts to settle the dispute with the city regarding the validity of its franchise, which was granted in 1906. It permits the company to open up the streets for laying conduits and otherwise installing its new system. Permission for this has been refused by the Mayor and Wire Commissioner, and for that reason the case is being taken to the courts. As soon as the courts render a favorable decision, the installation of the new telephone system will proceed as rapidly as possible.

A New Telephone Directory

A new directory has just been issued by the Home Telephone & Telegraph Company, of Riverside, Cal., and presents a very neat appearance. It contains four more pages than the former issue and has a list of 456 names. The company is in very good condition, and Manager Chapman reports a steady increase in business.

Tri-State Telephone Company Given Permission to Charge Extra for Slow Payment

An ordinance has been passed in Minneapolis whereby the Tri-State Telephone Company may charge a penalty of 25 cents for failure to pay for telephone service before the fifteenth of the month. When the rule recently adopted by the tele-

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phone company came up before the Council committee, it was decided that the Tri-State company should not be handicapped by failure to collect bills for service rendered. A very strong sentiment exists among the members of the Council that the company should not only be prevented from suffering any further inconvenience, as well as pecuniary loss, through neglect of subscribers to pay their bills promptly, but that the company should not be hampered in other ways, since it is furnishing excellent service at a very favorable rate in Minneapolis.

It is stated that it cost the Tri-State Telephone Company $10,000 a year to collect its bills before this rule was adopted. The company does not now receive more than $300 or $400 a year from its collectors, which shows that the rule has had the desired effect. The ordinance meets the approval of all the influential business men in Minneapolis.

North Carolina Independent Association Meeting

The third annual meeting of the North Carolina Independent Telephone Association was held at High Point, N. C., recently. The 200 Independent telephone companies throughout North Carolina were well represented, this meeting having the largest attendance in the history of the association. Many matters of importance were brought up at the meeting. The report of the various companies indicated a very favorable condition as regards growth and progress. Many toll lines have been built during the past year and many more are now being erected. The steady increase in the number of local telephones throughout the towns and cities of the State was very encouraging.

The officers elected for the coming year are: President, W. A. Wynne, Raleigh; vice-president, Mayor H. P. Grier, Statesville; secretary and treasurer, B. W. Levitt, Southern Pines. The executive committee is composed of W. A. Wynne, Raleigh; J. B. Morris, Roxboro; H. P. Grier, Statesville; H. P. Stephenson, Smithfield, and J. F. Hoyden, High Point.

Repentance by Telephone

A novel use of the telephone was made in Boston a few days ago by a thief who stole a valuable watch belonging to Alderman Curley. The watch was given the alderman by the Tammany Club, and was highly valued as a keepsake. The night the watch disappeared, the alderman was called up by telephone and was told that the one who took the timepiece did not realize that it was a valued keepsake until he had examined it, and the astonished city official was told that on the next day the watch would be returned by special messenger. In due time the watch was delivered as promised, in good running order.

A Young Telephone Operator

A young man who is starting telephone work at an early age is Benny Holiday, of Lorimer, Iowa, whose picture is reproduced below. Master Holiday, who is but eight years and eleven months of age, is already an expert operator and the pride of the Lorimer exchange of the Madison County Mutual Telephone Company. He is able to handle more calls in a given time than a good many old operators, and is also able to tell which rural line is calling when sitting with his back to the board. With such a promising start in the telephone field, Master Holiday should be heard from when he grows older.

Benny Holiday, a Young Iowa Telephone Operator.

Missouri Telephone Plant Changes Owners

The Atlanta Telephone Company, Atlanta, Mo., was recently sold by Albert Winn to R. E. Johnson, the consideration being $6,600. The plant is in first-class condition, having been in operation only four years. The town has a population of 530 and there are 137 subscribers connected to the exchange, which is quite a remarkable showing. There are also 20 farmers' lines connected to the exchange. Connections are had with the Independent company at Macon, Mo.

Telephone Patents

TELEPHONE APPARATUS FOR DESK SET.

James H. Thompson, Trenton, N. J., patent 896,173, Aug. 18, 1908.

This invention covers a device for taking up the slack in the wires of a desk set as the set is moved to various positions. The device is placed between the bell box and the desk set and consists of a spring-actuated drum upon which the wires leading to the desk set are wound. Means are provided for preventing undue twisting or injury of the wires during the use of the desk set. The apparatus allows the desk set to be used in various parts of the room, as the slack is immediately taken up by the drum mechanism.

TELEPHONE SWITCHBOARD APPARATUS.

Louis A. Brinkman, Chicago, Ill., patent 896,617, Aug. 18, 1908.

This patent covers improvements in key shelf construction of telephone switchboards. Means are provided for mounting the ringing and listening keys upon a single escutcheon plate. This requires a long slot in the key shelf, the springs and the frames supporting the springs being secured to the underside of the plate and extending through the slot, over which the escutcheon plate is fitted.

COIN-OPERATED ATTACHMENT FOR PAY TELEPHONES.

Edmond J. Lonergan, Chicago, Ill., patent 895,777, Aug. 11, 1908.

This invention relates to improvements in the mechanism of telephone pay stations.

The coin, when deposited in the insertion slot, 33, drops upon two pins in the armature of an electromagnet. By means of this magnet the telephone operator can either refund the coin or divert it into a retaining chute, through which it rolls and lodges in the upper end of chute 58. By means of a cam arm and lever, various mechanisms are operated which sound bell 41 and deposit the coin in a chute leading into the coin box. The coin is prevented from falling into the receptacle by a rod which holds it in front of a display slot until another coin is

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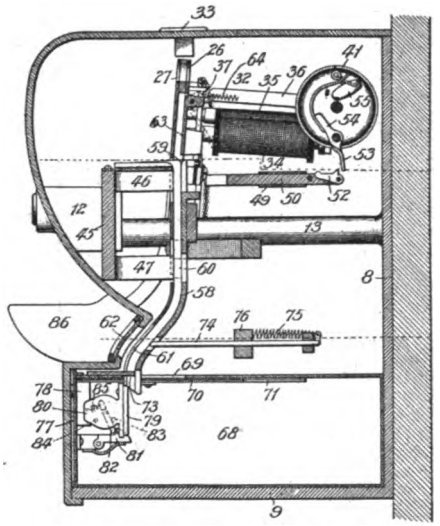
placed in the insertion slot. Each time the bell 41 is sounded a counter is actuated to register the operation of the machine. Another counter is placed so as to be operated when the door



77 is opened by the collector. With this arrangement the number of times the station has been operated and the number of times the door has been opened is registered.

PORTABLE TELEPHONE SUPPORTS

Wm. S. Aungst, Alliance, Ohio, patents 895,833 and 895,834, Aug. 11, 1908.

These inventions relate to desk attachments for supporting desk telephones. The devices consist of standards which may be clamped or screwed to the desk and a bracket having a clamp for holding the desk stand. The bracket may be made up of telescopic sections or of sections pivotally mounted so as to swing back upon each other.

TELEPHONE CALL REGISTER.

Bryon B. Brockway, Cleveland, Ohio, patent 896,081, Aug. 18, 1908.

This invention relates to call registers located at the subscriber's station. It comprises a lever operated Veeder cyclometer attached within the shell of the transmitter. Each time the cyclometer is operated a distinct sound is produced which is transmitted to the central office, thus notifying the operator that the call has been registered.

SUPPORTER FOR BOOKS AND TELEPHONES

S. W. Benson, Chicago, Ill., patent 895,536, Aug. 11, 1908.

This patent relates to a device for holding books, telephone, copy, etc., in a position so that it is out of the way when not in use. It consists of an arm and a holder comprising a clamp, a number of swivels and means for adjusting the swivels and clamps.

COIN BOX FOR TELEPHONES.

Charles S. Ellis, Chicago, Ill., patent 895,443, Aug. 11, 1908.

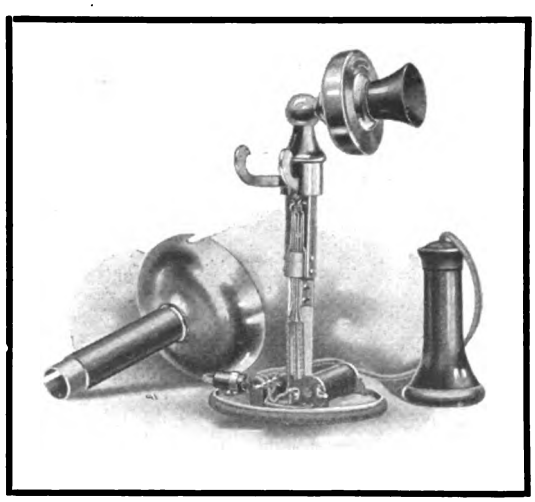
The object of this invention is to provide a simple and reliable coin-receiving and registering mechanism for telephone pay stations.

The operator is notified when a coin is deposited by the illumination of a lamp. The coin is caused to fall into a position where it may be automatically deposited in a coin receptacle or refunded to the customer, by the act of plugging into the jack of the called subscriber or by pressing a button. The coin channel is divided into sections and the coin must pass from one to the other in successive order before its final discharge into the coin receptacle. A registering device is also used in connection with this apparatus.

In the Manufacturing Field

The Holtzer-Cabot Desk Stand

A desk stand which has novel construction features of practical value is that shown in the accompanying illustrations. It presents a neat appearance and shows that care was taken in its design. The pedestal is made of heavy, seamless tubing, and the standard, where grasped by the hand, is covered with a shell of polished hard rubber. All other exposed parts are heavily nickel plated.



The Holtzer-Cabot Desk Stand with Casing Removed.

The mechanism of the stand is readily accessible, as by removing a single screw from the stem of the stand the upper section, which serves as a mounting for the transmitter and switchhook, can be pulled out and the pedestal casing removed. The upper part can then be replaced as shown, and conversation carried on or tests made. Connections are made between the two vertical divisions of the stand by a series of springs, to the terminals of which the various cords are attached. The springs are of heavy German silver with pure platinum contacts and rest against stops under tension, thus making positive contacts. The base is covered with heavy green felt which is securely clamped in place. The induction coil is mounted in the base of the stand, and thus permits the use of a two conductor cord when the set is used on common battery service. It can also be used for local battery service by changing the wiring.

The Holtzer-Cabot Desk Stand Assembled.

Another feature of the set which appeals to telephone mana-

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gers is the shape of the switchhook. This hook is so formed that it is said to be impossible to shake the receiver from it, thus avoiding a great deal of breakage of receiver shells.

This desk stand is manufactured by the Holtzer-Cabot Electric Company, of Brookline, Mass., and Chicago, Ill.

An American Switchboard for Bari, Italy

Evidence of the popularity of the new self-restoring drop recently put on the market by the Stromberg-Carlson Telephone Co. is furnished not only by the many orders received from operating companies in our own country for switchboards equipped with this new style of line signal, but by those coming from foreign countries. The three position switchboard shown in the accompanying illustration was recently shipped for use at Bari, Italy.

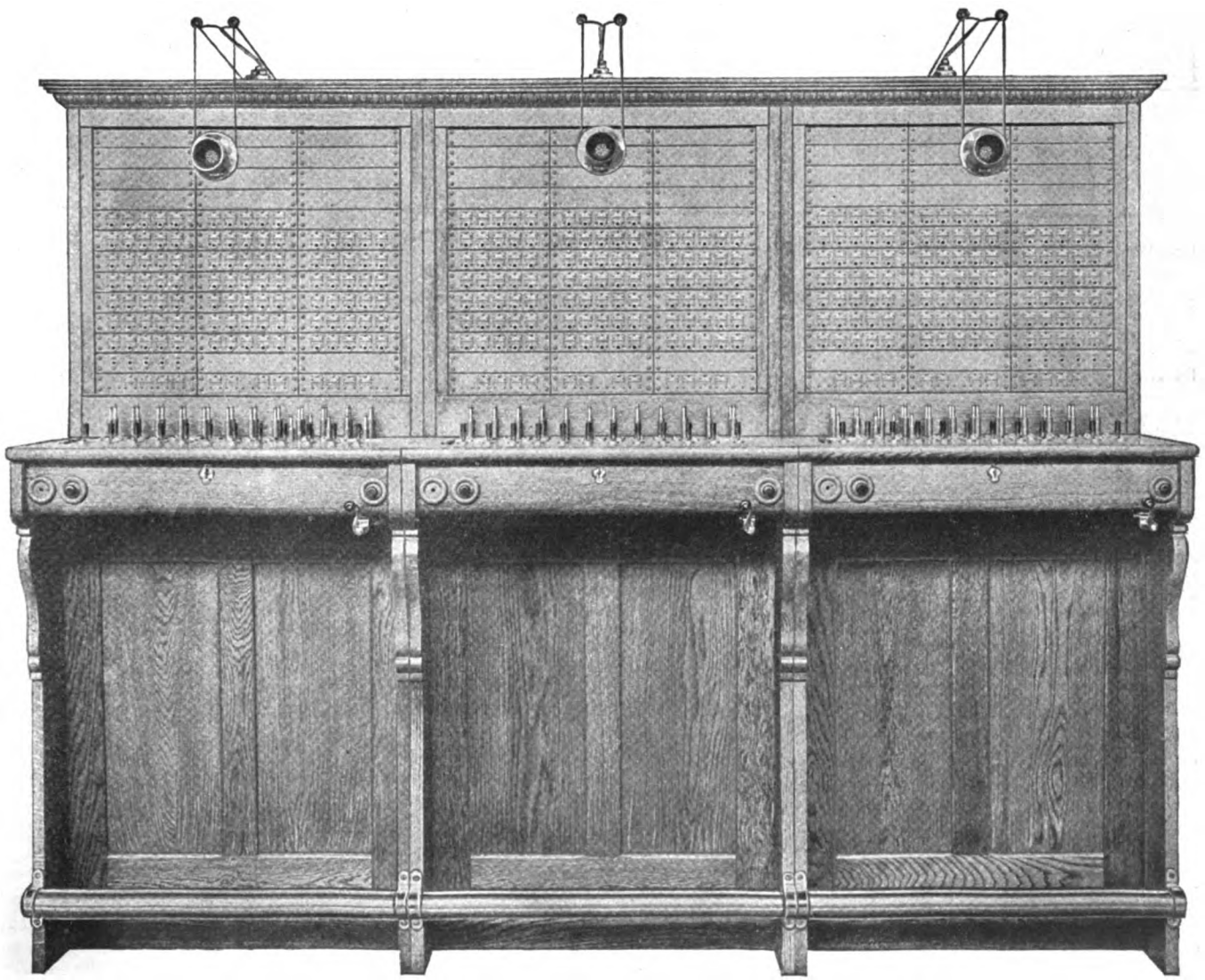
The switchboard wood-work is of rigid construction, consisting of three sections of the Stromberg-Carlson Co.'s A-1686 cabinet, as modified for self-restoring drop equipments, finished in golden oak. Each section is supplied with a brass foot rail. The plug shelf is covered with the best quality of heavy belt leather, and the interior is so arranged as to make all the apparatus readily accessible.

The equipment in all respect follows the latest ideas in American engineering practice as worked out by the Stromberg-Carlson staff. Each section is wired for an ultimate of 150 self-restoring drop lines, 100 of which are at present equipped. Twelve pairs of cords are supplied for each position, the first being wired for repeating coil circuits. The transfer circuit is of the type having a jack at the originating end, with the line running to a plug at the terminating end. Each position has an ultimate capacity of fifteen outgoing and fifteen incoming transfers. Associated with the plug, or incoming end of each transfer trunk is a supervisory signal lamp designed to operate upon an eight-volt battery. Of the transfer trunks, five outgoing and five incoming lines are at present installed in each of the first and third sections. For use in connection with the transfer circuits wiring for five-order wires is included in each position with one-order wire key at present installed in the first and third positions.

The operator's equipment is of the usual suspended transmitter type, consisting of a Stromberg-Carlson standard 8-B transmitter, suspended from an arm readily adjustable either as to height or distance from the face of board, and a 15-A receiver, with leather-covered headband and concealed terminals. The operator's jacks may be seen on the rail below the keyboard at the left of each position.

Directly beside each operator's jack will also be noted a switch for closing the night bell circuits. At the right of each position, and mounted upon the same rail with the operator's jacks are the switches used for changing from hand to power generator.

The line circuits enter the board through cables extending fifteen feet from the base of the first section, while the transfer trunks, order wires and miscellaneous circuits for each section are terminated on neat terminal strips located in the rear of the framework.



The Three Position Switchboard Equipped with Self-Restoring Drops, Recently Shipped to Bari, Italy, by the Stromberg-Carlson Telephone Manufacturing Company.

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FRANK B. COOK, 238 West Lake Street, Chicago, states that he has had to make increases in manufacturing facilities to take care of the increasing orders for his self-welding wire joint.

This device is now being used by many telegraph companies and railroads in addition to the telephone companies. Electric light and power companies are also using it on their transmission lines and it has been necessary to increase the range of manufacture to include all sizes of iron and copper joints for No. 0000 to No. 18. It is also made in sizes to accommodate stranded copper cable having a diameter as large as 83,000 circ. mil.

The peculiar construction of this joint makes it particularly valuable in all kinds of electrical construction wherein a joint would be used, as it is said to make an absolutely permanent joint which will not deteriorate owing to moisture penetrating and setting up corrosion or high resistance.

THE HOMER ROBERTS TELEPHONE COMPANY, Chicago, recently installed additional telephones for the Eau Claire Telephone Company, Eau Claire, Pa. The telephones supplied were of the standard selective ringing, lock-out type for party line service. This is the third order filled for this telephone company. The first telephones were installed at Eau Claire last winter and the latest reports show that there has not been a single case of instrument trouble reported. Although some of the ground wires have been burned off by lightning, none of the instruments have been damaged. This is due, to a great extent to the fact that the Roberts "self-cleaning" lightning arresters were placed on these telephones when they were installed.

THE MONARCH ELECTRIC & WIRE COMPANY, 125-127 South Clinton Street, Chicago, is distributing its new catalogues, containing about 900 pages.

Unusual care has been exercised in preparing this catalogue, the chief aim being to make it illustrative rather than descriptive. For that reason cuts have been used wherever possible and the reading matter is confined to a brief description of the articles or to suggestions regarding their use. By this method a much better idea of construction and appearance is obtained than would be possible from descriptive matter.

The catalogue is very complete and up to date and is one of the largest issued.

THE TOWERS PIN & BRACKET COMPANY, or Ellijay, Ga., has in stick several thousand telephone pins and brackets of the following sizes: 1¼-in. x 8-in. locust pins; 1½-in. x 9-in. oak pins, and 10-in. and 12-in. painted oak brackets. These are all of the best grade, and the company is making efforts to extend its business among the companies at convenient shipping distance.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued, and any items of interest as to their plants or systems.

PERSONAL

MR. CLYDE NORTON, of New Albany, Ind., has been appointed manager of the Cumberland Telephone & Telegraph Company's exchange at Shelbyville, Ky.

MR. B. S. READ, manager of the New Orleans exchange of the Cumberland Telephone & Telegraph Company, has been appointed superintendent of the New Orleans district, succeeding Mr. E. L. Powell.

MR. L. C. PARKER, of Nashville, Tenn., has been appointed manager of the exchange of the Cumberland Telephone & Telegraph Company at Baton Rouge, La.

MR. J. O. SPOTTS, manager of the Home Telephone Companies at Meridian and Hattiesburg, Miss., recently suffered a severe injury, being thrown from his carriage by a frightened horse. Mr. Spotts is recognized as an enterprising telephone man who has done much to build up the business at the exchanges of which he is in charge, and he will have the sympathy of all the men in the field.

MR. N. O. WOOD, manager of the Asheville and Hendersonville, N. C., exchanges of the Southern Bell Telephone Company, has been appointed superintendent of construction and plant. His territory will include North and South Carolina, with headquarters at Charlotte, N. C.

MR. CHARLES S. POWELL, formerly of the Westinghouse interests, and whose offices are at 165 Broadway, New York, has just returned from a trip through the South in connection with some engineering work which his firm is carrying out. Mr. Powell reports that the business conditions in the South are very cheerful and an optimistic tone is present everywhere. In Jacksonville, Fla., particularly the citizens are very proud of the fact that during the recent stringency, the city banks were able to meet the situation without recourse to clearing-house certificates. Jacksonville is one of the growing cities of the New South, and with the opening of the Panama Canal will be one of the most important ports on the Atlantic.

NEW COMPANIES

CERES, CAL.—Articles of incorporation have been filed by the Ceres Telephone Company. It has an authorized capital stock of $10,500, and the incorporators are: J. F. Campbell and S. E. Foster, of Modesto; Anthony Morgan, M. E. Taylor and J. B. Tapper, of Ceres.

ATHENS, GA.—Plans are well under way for the formation of an Independent telephone company at this city. In addition to local support, a considerable amount of foreign capital is to be enlisted. Subscribers are now being solicited, and an application for a franchise is to be made at an early date by the organizers.

JONESVILLE, IND.—A new telephone company is to be organized in this city. A temporary organization has been effected in the name of the Jonesville Mutual Telephone Company, and it is the intention to incorporate with a capital stock of $1,500. The temporary officers of the company are: President, Thos. J. Kobbe, and secretary-treasurer, Dr. W. T. Irvin.

BECIDA, MINN.—The Farmers' Telephone Company of Becida has recently been organized with Will Morse, of Becida, and J. J. Jenkinson, of Bemidji, as two of the principal officers.

LUDDEN, N. D.—Arrangements are being made for the organization of an Independent telephone company in Ludden, whose purpose is to construct a line from Lovell township to Ludden, and another which will connect with the Craft-Denison line, and be continued to Ellendale.

NARDIN, OKLA.—The Nardin Mutual Telephone Company has recently been incorporated by F. Congram, Thos. Cassidy and C. N. Tolle.

BOILING SPRINGS, PA.—Among the newly organized telephone companies is the Boiling Springs Telephone Company. A number of subscribers have already been secured, work on the construction of its lines commenced and the following officers elected: E. K. Lefever, president; George Lutz, vice-president; J. A. Ward, secretary.

FAYETTE CITY, PA.—A modern telephone system is soon to be installed in this city by an Independent telephone company. A charter has been granted to the Independent Telephone & Construction Company in behalf of the new organization, the Independent Telephone & Construction Company having been organized by men interested in the different Independent telephone companies in the valley solely for the purpose of launching local companies similar to the one which is to operate in Fayette City.

PAVIA, PA.—The Pavia & Imler Telephone Company, with headquarters at Pavia, has been organized, and has already constructed a line from Pavia, by way of Weyant, to Imler, at which place connections have been established with the lines of the American Union Telephone Company. A number of other extensions in its system are planned.

NEW DUNDEE, ONT., CAN.—Articles of incorporation have been filed by the New Dundee Rural Telephone Company, Limited. Its principal place of business is to be located in New Dundee, and it expects to install, maintain and operate telephone lines within the townships of Wilmot, Blenheim, Waterloo and North Dumfries. The new company has an authorized capital stock of $10,000, and the following directors have been elected: Jacob Clemens Hallman, Amos Hilborn, Alexander McDonald, Weslet Erb and David Bergey.

FINANCIAL

DE KALB, ILL.—The Exchange Telephone Company, of this place, has increased its capital stock from $25,000 to $50,000.

TRAER, IA.—At a recent meeting of the stockholders of the Traer Mutual Telephone Company the capital stock was increased from $9,000 to $72,000, and the limit of indebtedness fixed at five-ninths of the

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Condensed News Reports

capital stock. The old properties of the United Exchange Company, recently purchased from F. C. Van Vliete, John Sherrett and J. P. Tutt, are to be taken over early in October.

MINNEAPOLIS, MINN.—The directors of the Tri State Telephone Company have declared the twenty-first quarterly dividend at the rate of 6 per cent per annum, payable September 1st, 1908, to the stockholders of record August 20th, 1908. The company also, under its guarantee, will pay the twenty-sixth quarterly dividend of the Twin City Telephone Company at the stipulated rate.

GRAND FORKS, N. D.—The capital stock of the Eagle Telephone Company has been increased from $5,000 to $25,000.

SAXONBURG, PA.—The Saxonburg Telephone Company has increased its capital stock from $5,000 to $15,000.

CHARLOTTE COURT HOUSE, VA.—At a recent meeting of the directors of the Central Telephone Company a dividend of six per cent was declared. The company is in good condition, has retired some of its stock, and, in addition, has reduced its bonded indebtedness.

FRANCHISES

UTE, IA.—A petition has been presented to the mayor of Ute requesting that a special election be called for the purpose of granting a franchise to the Soldier Valley Mutual Telephone Company to do business in this place.

HASTINGS, MINN.—Application for a renewal of its franchise in this city has been made by the Hastings Telephone Company.

HUNTERS, WASH.—The Farm & City Telephone Company of Davenport has applied to the county commissioners for a franchise to construct a telephone line along the county road from Hunters to Daisy.

CONSTRUCTION

DECATUR, ALA.—An Independent telephone line from Swancott to Mooreville will be built by T. T. Ashford, of Birmingham.

FT. SMITH, ARK.—Within 60 days work on the construction of a telephone line between Fort Smith and Little Rock, an estimated distance of 160 miles, is to be commenced. This action was decided upon at a recent meeting of the officials of the Independent Telephone Association of Arkansas held at Ft. Smith, at which time the announcement was made that arrangements had been concluded for financing the proposition, it being understood that the cost of the work will be in the neighborhood of $50,000. W. H. Walker, of Ozark, is to be at the head of the Fort Smith-Little Rock line, and will superintend its construction.

WARREN, ARK.—The Valley Telephone Company, which has 600 miles of pole line, 100 stations, 13 exchanges and operates in seven counties, is planning many extensions in its plant. Among them may be mentioned the installation of a new metallic circuit between Warren and Dermott, via Monticello, a distance of about 40 miles.

REDLANDS, CAL.—A thousand-mile telephone line from El Paso to Redlands is to be built by the Consolidated Telephone, Telegraph & Electric Company, of Tucson, Ariz., of which Epes Randolph is president, the contract having been let to Charles F. Rolfe, of Redlands. The line is to follow the tracks of the Southern Pacific Railroad, and connections are to be established with the lines of the Southwestern Home Telephone Company, in which Mr. Rolfe is interested.

SACRAMENTO, CAL.—It is stated that the Pacific Telephone & Telegraph Company will expend $1,200,000 in new construction and improvements to its system in 1909-1910.

IDAHO FALLS, IDAHO.—The Independent Telephone Company of this city has completed a line to Rexburg, and is planning many other improvements and extensions in its system.

GROVELAND, ILL.—The Tazewell County Farmers' Mutual Telephone Company is installing a new switchboard at this place. It is expected that the work will be completed within a few weeks.

RICHMOND, IND.—It is the intention of the Indianapolis Telephone Company, as soon as the new franchise now pending before the City Council is granted, to expend about $50,000 in the reconstruction of its plant.

ADEL, IA.—Among the extensions planned by the Linden-Adel Telephone Company is the construction of a number of rural lines.

ALGONA, IA.—The Algona Telephone Company is installing an addition to its switchboard and also putting up a 200-pair cable. The improvements are expected to be completed about the first of September.

ALTOONA, IA.—The Rural Four-City Telephone Company expects to install exchanges in Altoona, Mitchellville, Prairie City and Runnells.

CAMPI, IA.—The exchange of the Campi Telephone Company in this place recently opened with a list of 25 subscribers.

ELDORA, IA.—A new exchange building is to be erected in this city by the Eldora Telephone Company, in which the most modern equipment is to be installed.

IOWA CITY, IA.—The lines of the Johnson County Telephone Company in Iowa City are being thoroughly overhauled.

TRAER, IA.—The Traer Mutual Telephone Company is making arrangements for materially improving its plants in Traer, Reinbeck and Gladstone, as well as to build lines establishing connections with a number of the adjoining places.

ELDORA, KAS.—A new exchange building is being erected in Eldora by the Butler County Telephone Company.

HUMBOLDT, KAS.—Many improvements in its system in Humboldt are being made by the Missouri & Kansas Telephone Company.

BATON ROUGE, LA.—A private branch exchange telephone switchboard is to be installed in the State Capitol building in accordance with an act of the last General Assembly.

NAPOLEONVILLE, LA.—The exchange of the Cumberland Telephone & Telegraph Company is to be reconstructed, new poles erected throughout the city and a metallic system installed.

WINNSBORO, LA.—Mr. E. D. Selmser, of the North Electric Company, Dallas, Tex., is at work at Winnsboro, La., installing equipment for a new telephone exchange.

HAGERSTOWN, MD.—The American Union Telephone Company contemplates expending $90,000 for improvements and extensions to its system.

YPSILANTI, MICH.—The Washtenaw Home Telephone Company, which operates exchanges in this place and Ann Arbor, will soon begin construction of farm lines in this vicinity.

WILLMAR, MINN.—The Great Northern Railroad, which is now installing a telephone system for despatching between Willmar and Breckenridge, is planning for similar installations on other divisions of the road.

GLOVERSVILLE, N. Y.—The directors of the Glen (Bell) Telephone Company have voted to expend $5,000 for construction of a new line between Fort Plain and Canajoharie. It intends to open exchanges in these places in the fall.

McCONNELLSVILLE, N. Y.—The lines of the McConnellsville Telephone Company have been overhauled and rebuilt during the past few months.

MIDDLETOWN, N. Y.—A ring distribution system of telephone wires is being installed by the Orange County Telephone Company, wires being strung along the sides and backs of buildings in the center of the city. When the work is completed all of the aerial wires will be taken down, leaving only the main aerial cables.

PLATTSBURGH, N. Y.—Among the improvements in its system planned by the Clinton Telephone Company, which now has in process of completion connections with the Commercial Telephone Company of Troy, and which will open service from Port Henry to Hudson River points, may be mentioned the construction of a line to West Chazy, another to Ellenburgh and the installation of an up-to-date system in Dannemora.

PULASKI, N. Y.—The lines of the Black River Telephone Company around Pulaski are being overhauled and extended.

ST. JOHNSVILLE, N. Y.—The Interstate Telephone Company is planning for the establishment of a toll line between St. Johnsville and Little Falls, its present facilities being inadequate to take care of its increasing business.

MEDINA, N. D.—Work has been commenced by W. J. Dwyer on a branch line fifteen miles in length from his main telephone line.

JEFFERSON, OHIO.—A number of new lines are being erected in this city by the Jefferson & Warren Telephone Company, and its system made up-to-date in every particular.

LIMA, OHIO.—A new exchange building is being erected in Lima by the Central Union Telephone Company.

ASTORIA, ORE.—A new building is to be erected in this city by the Pacific Telephone & Telegraph Company, in which it expects to install the most modern exchange equipment.

ALLENTOWN, PA.—At a recent meeting of the directors of the Interstate Telephone Company in this city, plans were discussed for the extension of the company's lines in northern Jersey, and for the extension of the lines of the Atlantic City and Ventor plants.

FAYETTE CITY, PA.—A first-class Independent plant is to be put in at Fayette City, Pa. The Independent Telephone Company has been recently incorporated, and plans are already made for the installation of switchboard equipment for 350 lines and a modern outside plant. Surrounding cities are now heavy users of Independent service, and there has for some time been a demand for an exchange in Fayette City which could give connections with the other Independent companies. It is expected that there will be an immediate and heavy demand for Independent telephones, and the new company starts in with good prospects of early success.

SHAMOKIN, PA.—New exchange quarters are soon to be occupied by the United Telephone Company in this city, in which a new switchboard is to be installed, the old one having proved inadequate to take care of the company's greatly increased number of subscribers.

WAYNESBORO, PA.—It is stated that another telephone line will be constructed between Blue Ridge Summit and Monterey. The matter has been agitated by some of the residents of that section and may soon result in a line to connect with the American Union or United Telephone Company at Rouzeville.

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Condensed News Reports

CLARENDON, TEX.—The Clarendon Telephone Company, which has just completed a 12-mile extension to its system, is planning other improvements.

SALT LAKE CITY, UTAH.—A telephone line between this city and Wells, Nev., 211 miles, has been completed and operates very satisfactorily.

BARHAMSVILLE, VA.—A new telephone line from this city to Toano, via Diascund, is being erected by Messrs. Potts and Kidder, of Barhamsville.

FAYETTEVILLE, W. VA.—The Beckley & Fayetteville Telephone Company, of which C. Mankin, of Oak Hill, is president, has now over fifty miles of line in operation, and is planning to still further extend its system.

OAKVALE, W. VA.—The Oakvale Telephone Company contemplates constructing a telephone system in Mercer County.

WHEELING, W. VA.—The Wheeling Traction Company has installed a telephone system between Bridgeport and West Wheeling.

AIRDRIE, ALB., CAN.—The farmers' telephone line in this district has been completed and is now in operation. The system includes thirteen miles of pole line and 30 miles of wire with twenty-five subscribers. The installation cost approximately $40 per telephone and an annual levy will be made for maintenance.

BOISSEVAIN, MAN., CAN.—Contracts for the construction and installation of a telephone system throughout the Municipality of Morton has been let to Elliot & Welch, of this place.

CARMAN, MAN., CAN.—The Government has secured a number of subscribers for the proposed telephone line in the district west of this place and arrangements are now being made for its construction.

WINNIPEG, MAN., CAN.—The new Government telephone exchange in this place will be ready for occupancy about October 1st.

WINNIPEG, MAN., CAN.—The Manitoba Telephone Commission is now constructing a line to Hannah, North Dakota.

ELECTIONS

PLATTSBURGH, N. Y.—The following officers were elected at the annual meeting of the stockholders of the Clinton Telephone Company: President, J. M. Weaver; vice-president, I. H. Griswold; treasurer, I. Merkel; secretary, A. Sharron.

CHARLOTTE COURT HOUSE, VA.—The following officers and directors were re-elected at a meeting of the stockholders of the Central Telephone Company; President, Captain Andrew J. Terry; general manager, secretary and treasurer, W. G. Williams; directors, J. C. Carrington, F. C. Thornton, A. J. Terry, S. A. Lawson and Lee W. Morton. The executive committee is made up of J. C. Carrington, F. C. Thornton and Captain N. L. Shaw.

FREDERICKSBURG, VA.—The Toluca & Fredericksburg Telephone Company at a recent meeting elected the following officers: Hugh Adie, president; C. A. Bryan, secretary. The directorate is composed of: T. J. Waller, C. A. Bryan, R. A. Moncure, A. J. Pyke, Hugh Adie and Dr. E. M. Snead.

NORTH AUGUSTA, ONT., CAN.—The following officers have been elected by the Leeds & Grenville Independent Telephone Company of this city: President Reeve J. H. Dawson; vice-president, A. P. Bissell. The managing director is Charles J. Johns.

MISCELLANEOUS

HUNTSVILLE, ALA.—Announcement is made at this city that Judge Shelby, of the United States Court of Appeals, upon the petition of Frank Caughring, of Toledo, O., has placed the Long Distance Telephone Company, of Decatur, Ala., in the hands of receivers. The receivers are: L. G. Barker, of Louisville, Ky., and Douglass Taylor, of Huntsville, Ala., the bonded indebtedness of the company being given at $586,000.

FOURCHE, ARK.—The telephone exchange in this place was destroyed by fire on August 15th.

SANTA BARBARA, CAL.—A telephone rate war is now on between the Santa Barbara Telephone Company and the Pacific Telephone & Telegraph Company. The latter company has made a reduction of almost 50 per cent in the residence telephone rate.

JOLIET, ILL.—The telephone companies in this place had considerable trouble as the result of the series of storms which swept over this section of the State last week. Several hundred telephones were put out of commission and the toll lines were inoperative for some time.

BLOOMFIELD, IA.—The plant of the Davis County Telephone Company is to be taken over by the Bloomfield Telephone Company, and many improvements and extensions in the system made.

WILMORE, KY.—As a result of a fire which visited this city, the exchange of the Jessamine Home Telephone Company was destroyed. It is the company's intention to at once commence the erection of a new exchange.

ST. JOSEPH, MO.—The City Counselor, W. B. Norris, has recently ruled that poles and conduits of the telephone companies in St. Joseph may be used by the city free of cost in installing a police and fire alarm signal system.

NAPLES, N. Y.—The telephone companies in this place have offered free service to all the schools within the corporation.

NEW YORK, N. Y.—Charles M. Myers and Edward M. Colie, co-receivers of the Telephone, Telegraph & Cable Company of America, have brought suit in the New York Supreme Court against John Jacob Astor and others to force the payment of balances due on stock of the company for which they had subscribed. Astor subscribed for 10,000 shares at $15 per share, to be paid in installments of $2.50 per share quarterly. The first four installments were paid by Mr. Astor, but there is still due the company $5 on each share. It is said that Charles W. Morse purchased more than one-half of the outstanding stock at 50 cents on the dollar of its par value. The company was a holding corporation of New Jersey, organized to take over all Independent telegraph and telephone companies, but afterward is understood to have come into the control of competing interests.

NORWICH, N. Y.—About twelve hundred telephones of the Marquis Independent Telephone Company were put out of commission on account of a fire which occurred in Norwich. It is stated that the company's large switchboard has been ruined by water, and that it will be quite a few days before the lines are again in working order.

WEST ELKTON, OHIO.—A merger has been effected between the Independent and Bell telephone systems in Preble County, effective September 1st. At that time the Preble County Telephone Company will take over the Bell exchange at West Elkton with 140 subscribers, the Bell company continuing to control the long distance service.

SPOKANE, WASH.—A report by the Board of Public Works has been recently made to the City Council regarding the Home Telephone Company's construction work in this city. The report states that construction work is being carried on in accordance with the conditions of the franchise granted to the telephone company.

RACINE, WIS.—The Common Council has ordered the Wisconsin Telephone Company to remove all telephones from the city offices. This is in accordance with the Public Utility Law which prevents telephone companies from giving free service to municipalities.

TREHERNE, MAN., CAN.—Estimates and plans have been made by the Manitoba Telephone Commission showing that the work of constructing a telephone system in the Municipality of South Norfolk would cost $17.80 per telephone per year. About a year ago the Municipality of South Norfolk decided to install a municipal telephone system and offered telephone service at $15 per year receiving 112 subscribers at that rate.

NIAGARA FALLS, ONT., CAN.—It is stated that at the next session of the Provincial Legislature the Government will introduce a new measure in which provision will be made for the control, stimulation and development of county and Independent telephone systems operating in Ontario under Provincial charters. Two propositions are believed to be under consideration, one appointing a Provincial Commissioner of Telephones, an expert with advisory, consultative and executive power; the other to enlarge the membership of the Ontario Railway and Municipal Board by the addition of a representative expert on telephone problems.

MAPLE CREEK, SASK., CAN.—The first of the local telephone companies organized under the new government regulations is now in operation here under the name of the Maple Creek Telephone Company. The rates charged are $2 and $1.25 per month respectively for business and residence telephones.

PUEBLA, MEX.—There is considerable agitation in this place against the local telephone company on account of the raise in the rate of $3 monthly to $5. The Chamber of Commerce has advised all merchants and subscribers to refuse to pay the new rate and as the result the list of subscribers has dropped nearly 75 per cent.

UNDERGROUND

CASEY, ILL.—The Shimel Telephone Company is installing conduit in the business districts to care for its wires. This company has made many improvments in its system, and is always ready to make any expenditures necessary for giving the best service.

SALISBURY, MD.—Telephone wires in the business section of this place are to be placed underground within a short time.

DULUTH, MINN.—Additional cables between Duluth and Superior are to be laid by the Duluth Telephone Company.

HAMILTON, OHIO.—An ordinance has been passed permitting the Hamilton Home Telephone Company to build, construct and maintain conduits for telephone wires in the streets and alleys of this place.

HUDSON, OHIO.—Both telephone companies have agreed to place their wires underground in this place.

ORRVILLE, OHIO.—The Marion, Wooster and Ohio Telephone Company expects to install about 7,000 ft. of cable in this city.

PORTLAND, ORE.—Steps are being taken to compel all wires to be placed underground in certain sections of Portland.

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WANTED

The rate for "Wanted" advertisements of 25 words or less is $1.00 an insertion; additional words 4 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—Telephone photographs; owners of photographic negatives showing interesting examples of telephone work can learn of an opportunity to dispose of prints at a profitable figure by addressing Box 1126, care AMERICAN TELEPHONE JOURNAL, 239 West 39th Street, New York.

HELP WANTED

The rate for "Help Wanted" advertisements of 25 words or less is 50 cts. an insertion, additional words 2 cts. each, payable in advance. Remittances and copy should reach this office not later than Monday, 5:30 P. M., for the next succeeding issue.

WANTED.—A number of first-class experienced telephone solicitors; give reference and state salary expected. NATIONAL TELEPHONE COMPANY, G. M. Dept., Wheeling, W. Va. 1156

WANTED.—First-class telephone switchboard salesman. In replying state experience in detail, giving reference and salary expected. Address Box 1161, care AMERICAN TELEPHONE JOURNAL, 239 West 39th St., New York.

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A time and money saver. Each wire can be clamped separately. Write us for sample and prices.
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We "treated by our dead oil of coal tar process will never decay.
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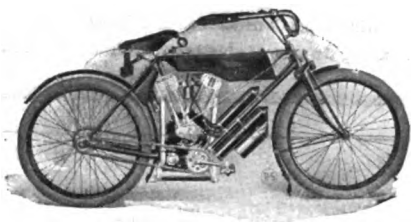

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Sample Doz. - 12½ Cts. Each
100 Lots - - 11 " "
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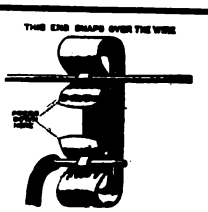

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For connecting bridging 'phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.

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Storage Battery Dept.
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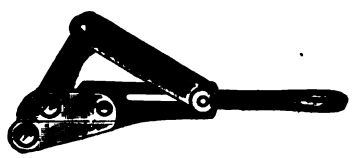

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Terminals and Junction Boxes

are noted for high quality and extreme reliability. Standard among telephone men who know what's what. Plug in and let's talk it over.

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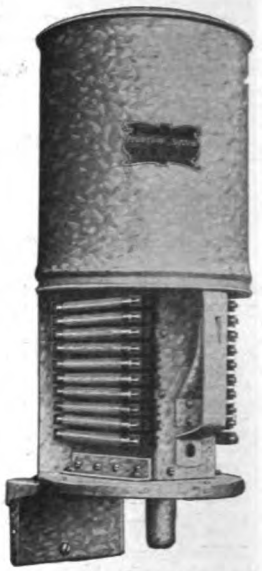
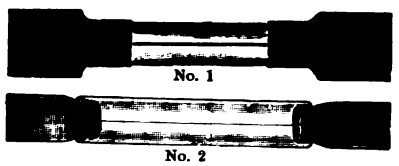


TYPE S-6. COOK POLE CABLE TERMINAL

The CONDITION of the FUSE

SEEN AT A GLANCE THRO. THE GLASS



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Mica Fuses
Copper Term., $1.25 per 100
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HERE'S A POLE SEAT THAT SPELLS "SAFETY"

Exactly what we want, you'll say, providing it doesn't look unsightly and cumbersome, providing it hasn't rough edges and isn't hard and costly to install on the pole. And we, in turn, can guarantee that you'll have absolutely *no* fault to find with this pole seat. Besides, the prices are low, $1.25 and $2.50.

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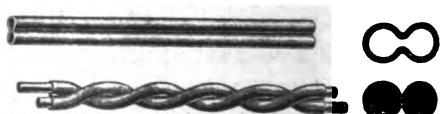
THE SEYMOUR MFG. CO.

SEYMOUR, CONN

GERMAN SILVER
RESISTANCE SHEET AND WIRE
COPPER WIRE
BRASS, BRONZE AND COPPER

H.-C. Seamless Tubular Wire Connectors



make a perfect self-welding joint. They are seamless and are drawn up from sheet copper and may be tinned for use with iron wire. Atmospheric conditions cannot impair their efficiency. Write for price lists.

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4 Sizes
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Full Size of Tube, 1" x 5"

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FOR USE ON PLASTERING

Exact Size
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QUALITY
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BETTER THAN OTHERS

100 DIFFERENT TYPES
WE HAVE WHAT YOU WANT
SEND US A SAMPLE
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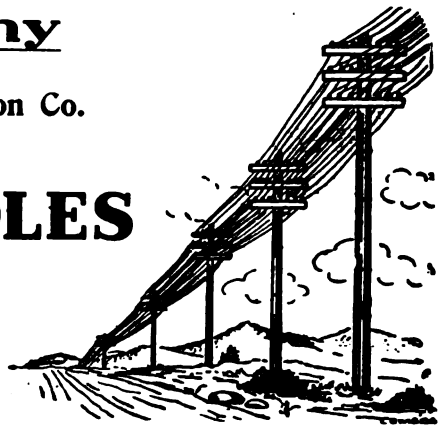
Yards from Maine to Washington



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In any length.

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Prompt Shipment — Best Grade

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Give best service. Our prices are lowest. May we quote?

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We Will Refund Your Money

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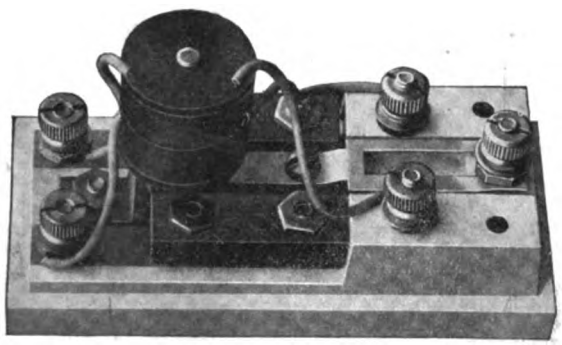

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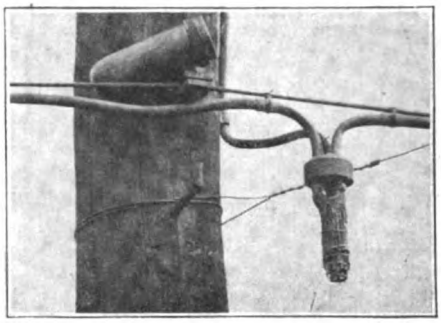
AMERICAN ELECTRIC FUSE CO.

MUSKEGON, MICH.
EASTERN SALES OFFICE
NEW YORK CITY

Patented Oct. 17, 1905



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WHERE MATTHEWS' JOINTS ARE USED

Take your pair of spanner wrenches, unscrew the pot from the ring, unlace the pairs and spread them out like a fan. You can then test any of the pairs with greater ease than you can test pairs on the outside layer of a Horizontal Wiped Joint. When test or repair is finished, all that you have to do is to screw the pot on to the ring and tighten with the spanners, and you have a perfect moisture-proof joint. It is not necessary to drag the cable platform, block and tackle, blow torch, etc., from one joint to another.

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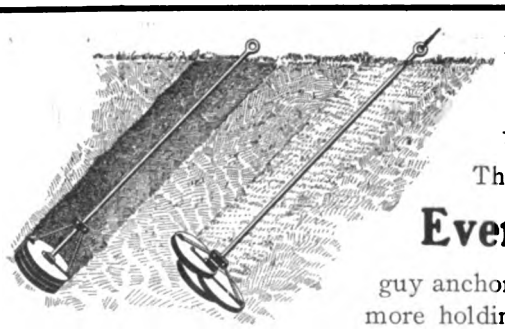

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POLES 20 and 25 feet lengths for rural telephone lines a specialty.

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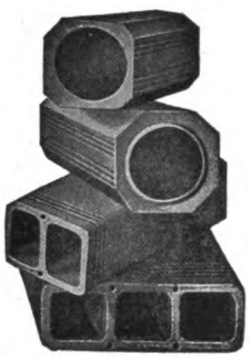

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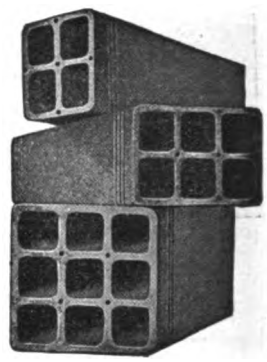
SINGLE and MULTIPLE DUCT



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Made for practical work, and they do it right. Their mission is to protect your lines from charges of excessive potential whether due to lightning or other causes, and they fulfill this mission invariably and infallibly.
Details, prices and references await your inquiry.

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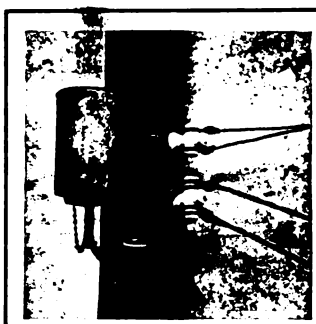

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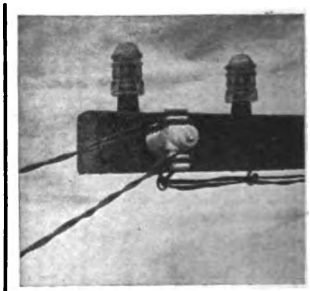

SUGGESTION No. 4

SUGGESTION No. 5

SUGGESTION No. 8

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They solve all twisted pair distribution problems.
A groove for each wire—Prevents crosses.
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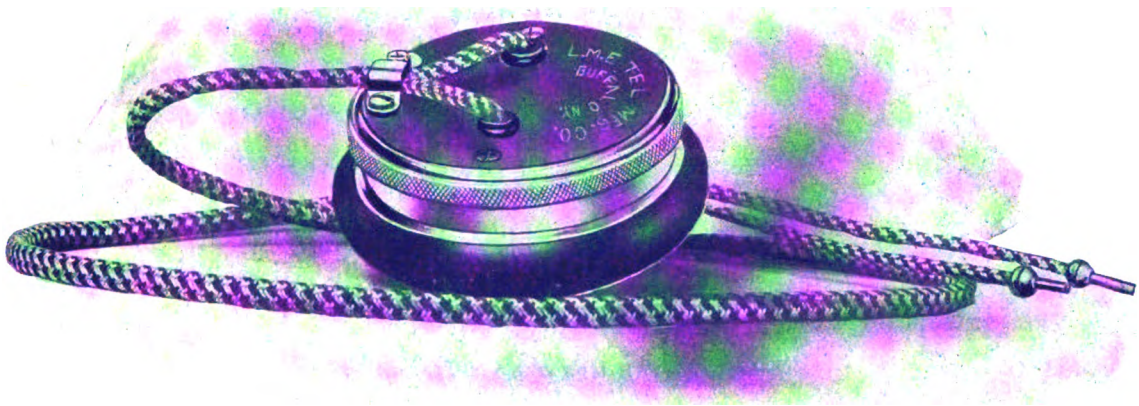

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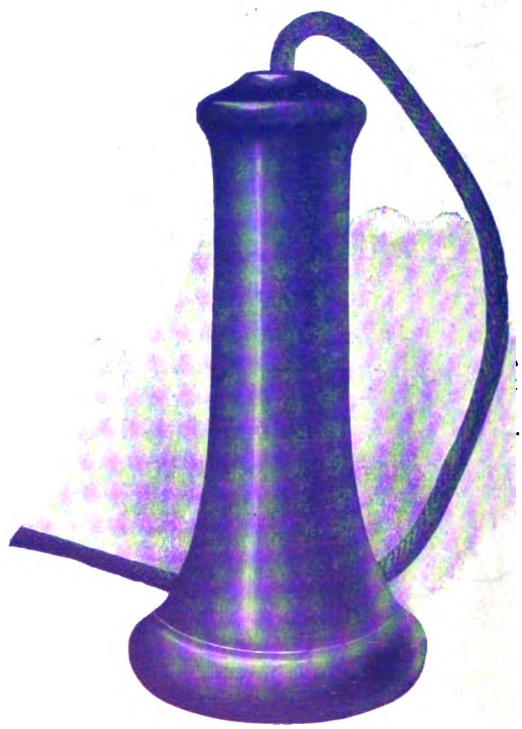

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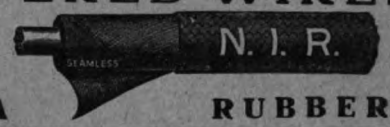

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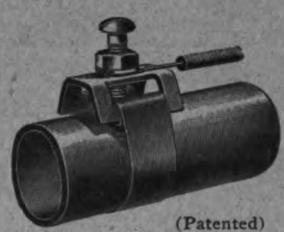

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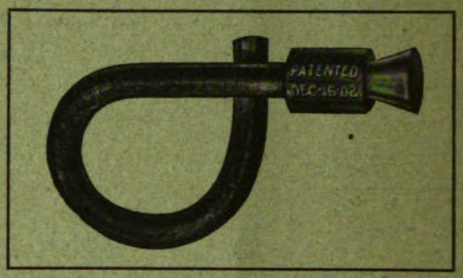

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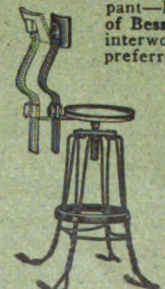

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Legal Editor, American Telephone Journal, Member of the Bay City, Michigan, Bar.

340 Pages

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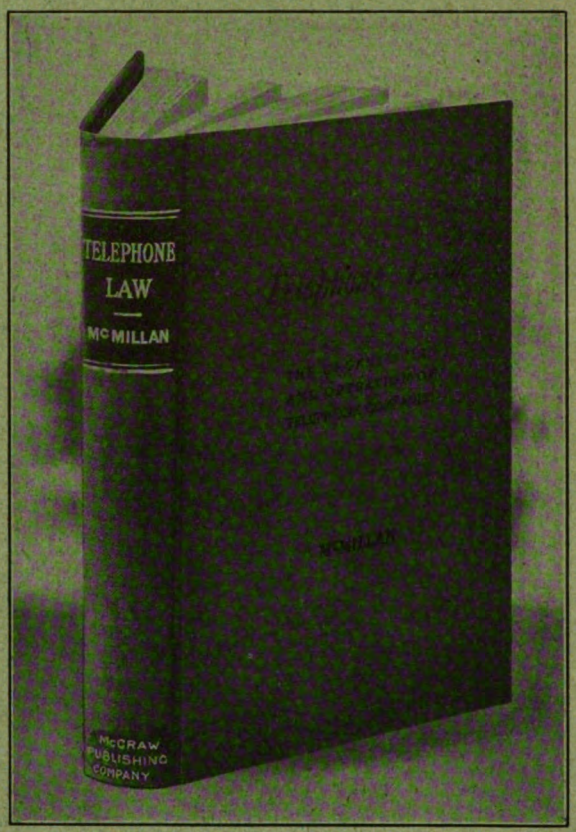

¶ Intended not for practicing lawyers so much as for persons actually engaged in the telephone business, and gives in compact and concise form such legal information as will be valuable to practical men. In most cases authorities are quoted in order to establish the propositions laid down. During the progress of this work a thorough examination of the statutes of different states was made and references to these are given. ¶ The Appendix of Forms contains nearly every legal form that might possibly be wanted by any new or established telephone company.

CONTENTS

CHAPTER I.—The Choice of a State from Which to Secure a Charter. II.—What the Charter Should Contain. III.—Organization Code of By-Laws and Regulations. IV.—Keeping the Records of the Corporation. V.—Federal, State and Municipal Franchises. VI.—Ordinances, Commonly Called Franchises, Providing the Regulations under which Telephone Companies are Permitted to Build Lines in Municipalities. VII.—Rates, Rentals and Charges. VIII.—Rights of Way and Private Owners. IX.—Eminent Domain. X.—Location of Poles and Wires. XI.—Respective Rights of Telephone Companies and Electric Light and Traction Companies. XII.—Building Through Established Lead. Joint Occupation of Pole Lines. XIII.—Subways and Underground Conduits. XIV.—Cutting and Trimming Trees. XV.—Financing Plans and Securities. XVI.—Telephone Companies as Public Carriers. XVII.—Taxation. XVIII.—Questions of Damages. XIX.—Contracts, Fire Insurance, Employers' Liability Insurance, Regulations and House Moving. XX.—Appendix of Forms.

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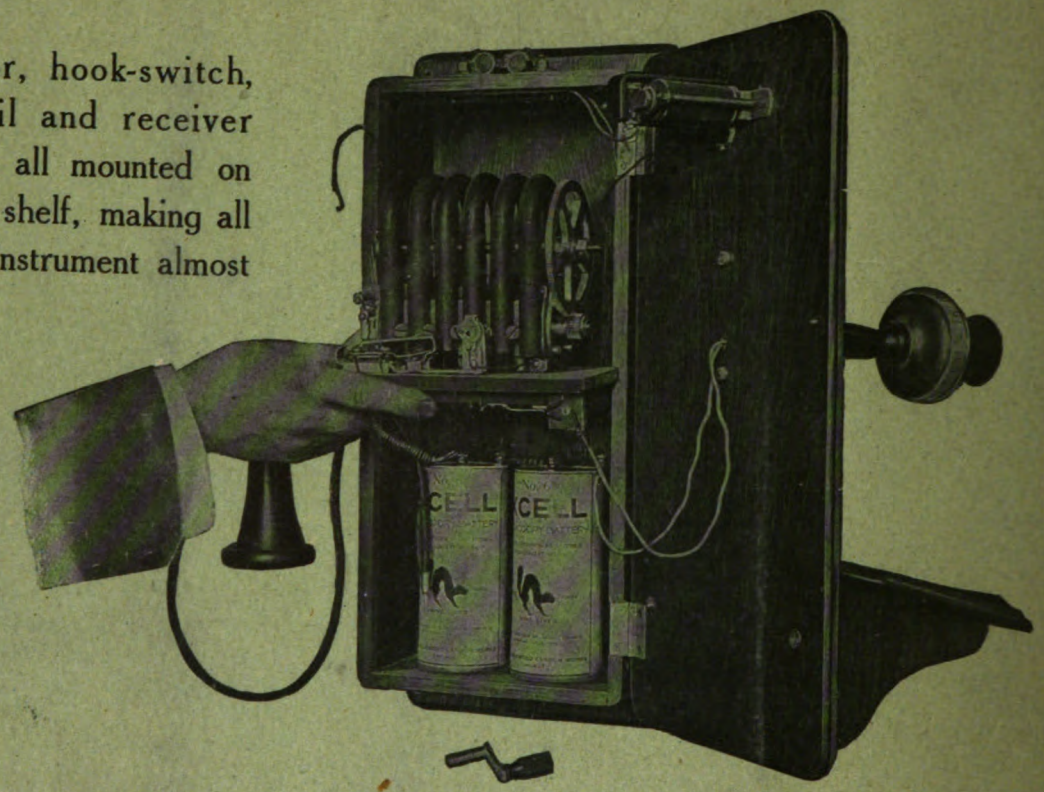

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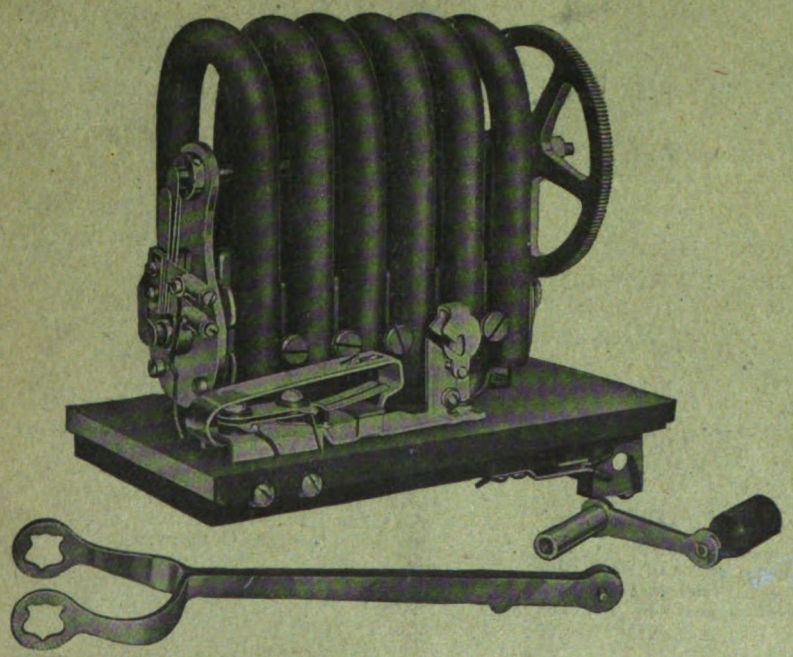

¶ 5 inches shorter than the "compact" type telephone—and all interior parts more accessible. ¶ No wiring except on shelf and that is all insulated. ¶ No hinge connections—ringer and transmitter connected with flexible cords.

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